QK1
.J5952

THE

JOURNAL OF BOTANY

BRITISH AND FOREIGN.

Edited by

JAMES BRITTEN, F.L.S.,

BRITISH MUSEUM (NATURAL HISTORY), SOUTH KENSINGTON

VOL. XXIV.

ILLUSTRATED WITH PLATES.

MISSOURI
BOTANICAL
GARDEN.

LONDON:

WEST, NEWMAN & CO., 54, HATTON GARDEN.

1886.

LONDON:
WEST, NEWMAN AND CO., PRINTERS,
54, HATTON GARDEN, E.C.

CONTRIBUTORS

TO THE PRESENT VOLUME.

F. H. Arnold.
C. C. Babington, M.A., F.R.S.
J. G. Baker, F.R.S.
John Ball, F.R.S.
R. M. Barrington, M.A., F.L.S.
W. H. Beeby.
Arthur Bennett, F.L.S.
J. P. Bisset.
G. S. Boulger, F.L.S.
R. Braithwaite, F.L.S.
James Britten, F.L.S.
B. Carrington, M.D.
W. Carruthers, F.R.S., Pres.L.S.
R. Miller Christy, F.L.S.
B. Clarke, F.L.S.
Anstruther Davidson.
H. N. Dixon, M.A., F.L.S.
G. C. Druce, F.L.S.
W. Fawcett, B.Sc., F.L.S.
T. B. Flower, F.L.S.
John Fraser.
Alfred Fryer.
W. B. Grove, B.Sc.
Henry Groves.
James Groves, F.L.S.
F. J. Hanbury, F.L.S.
H. F. Hance, Ph.D., F.L.S.
A. W. Harrison.
H. C. Hart, B.A.
G. A. Holt.
B. Daydon Jackson, Sec.L.S.
G. S. Jenman, F.L.S.
J. H. A. Jenner.
E. F. Linton, M.A.
W. R. Linton, M.A.
George Massee, F.R.M.S.
H. T. Mennell, F.L.S.
W. F. Miller.
Baron F. von Mueller, K.C.M.G., &c.
George Murray, F.L.S,
R. P. Murray, M.A., F.L.S.
George Nicholson.
William Phillips.
H. P. Reader, M.A.
H. N. Ridley, M.A., F.L.S.
W. Moyle Rogers, F.L.S.
R. A. Rolfe, A.L.S.
John Roy.
James Saunders.
W. G. Smith, F.L.S.
S. A. Stewart.
H. Trimen, M.B., F.L.S.
W. West.
J. W. White.
F. N. Williams, F.L.S.

Directions to Binder.

Portrait of W. W. Newbould to face title.

Tabs. 263, 264	to face page 1
Tab. 265	„ 65
Tabs. 266, 267	„ 129
Tab. 268	„ 193
„ 269	„ 257
Tabs. 270, 271	„ 321

Or all may be placed together at the end of the volume.

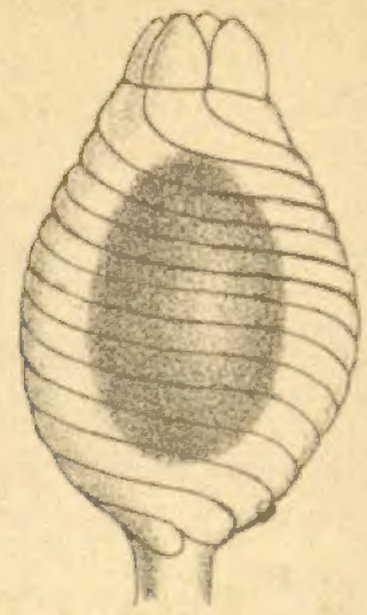
Tab. 264.

M. Groves del.
R. Morgan lith

West, Newman & Co. imp.

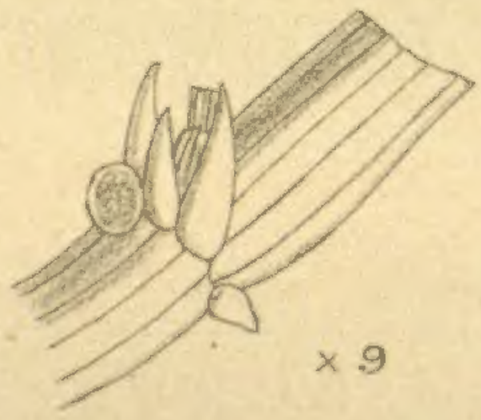
Nitella capitata, *Ag.*

Tab. 263.



x 20

x 9



x 9

THE

JOURNAL OF BOTANY,

BRITISH AND FOREIGN.

NOTES ON THE BRITISH *CHARACEÆ* FOR 1885.

By Henry & James Groves.

(Plates 263 & 264).

The past season, as regards the number of new county records, shows, as might be expected, a considerable falling-off when compared with previous years, but two species have been added to the certainly British *Characeæ*, viz., *Nitella capitata* and *Chara intermedia*. The discovery of a *Tolypella* in Caithness and *Lychnothamnus stelliger* in Surrey are the most important additional county records. It is satisfactory to be able to add several notes for the Irish counties.

We have again to thank our many correspondents for the specimens they have kindly sent us.

Chara fragilis, Desv.—Somerset N., 1883, *W. Joshua*; Hants N., 1885, *Miss C. E. Palmer*; Sutherland E., 1885, fide *O. Nordstedt*; Kerry S., 1885, *E. F. & W. R. Linton*; Mayo E., 1885, *E. F. & W. R. Linton*.

var. *barbata*.—Salop, 1884, *W. E. Beckwith*, comm. *A. Bennett*.

var. *capillacea*. — Dorset, 1883, *H. N. Ridley & W. Fawcett*; Carnarvon, 1885, *J. E. Griffith*; Pembroke, 1882, *H. N. Ridley*; Down, 1885, *R. L. Praeger*, Hb. *S. A. Stewart*.

var. *Hedwigii*.—Staffs., 1885, *H. Searle*; Mayo E. & Galway W., 1885, *C. Bailey*.

var. *delicatula*. — Anglesea, 1884, *C. Bailey*; Mayo E. & Galway W., 1885, *C. Bailey*; Leitrim, 1884, *R. M. Barrington*.

C. aspera, Willd. — Cheshire, Moreton, 1885, *H. Searle*; Forfar, Rescobie Loch, 1882, *A. Sturrock*, comm. *A. Bennett*; Galway W., Oughterard, 1885, *E. F. & W. R. Linton*.

var. *subinermis*.—Antrim, Lough Neagh, 1884, *H. W. Lett*, Hb. *Joshua*.

C. papillosa, Kuetz., Regensburg Bot. Zeit., 1834, i., p. 707; Phyc. Germ., p. 260; Sp. Alg., p. 526; Tab. Phyc., vii., tab. 70, fig. 1; Braun, Schweiz. Char., 1847, p. 17; Wallman, Act. Stockh., 1852 (1854), p. 308.

C. intermedia, Braun, R. & S. Exsicc. (1859), Nos. 45 & 46; Consp. Char. Europ., p. 6; Krypt. Flor. Schles., p. 406; Fragm. Monog. Char., p. 151; Wahlst., Bidr. Skand. Char., p. 21; Monog. Sver. Norg. Char., p. 33; Nordst., Bot. Notiser, 1863, p. 50; Leonhardi, Oesterr. Arml., p. 80, *ex parte*; Sydow, Europ. Char., p. 62.

Exsicc.—Braun, R. & S., 45, 46, 93–5; Nordst. & Wahlst., 32, 34; Aresch., Alg. Scand., 45.

Usually much incrusted. Stem stout, 1–3 ft. high, with 2 rows of cortical cells to each branchlet, primary cortical cells more prominent than the secondary. Spine-cells few, varying from long and more or less spreading to minute and papilliform, usually solitary or two together. Whorls of 7–10 long, rigid, straight or slightly curved branchlets. Stipulodes short. Branchlets of 6–7 joints, usually 2–4 ecorticate. Bract-cells about 6, the 4 inner equalling or exceeding the nucules, the outer minute. Nucules ovoid, about 15-striate. Coronula rather short. Nucleus nearly black. Monœcious. Tab. 263.

This species is closely related to *C. baltica*, and it has been sometimes considered an inland incrusted form of that plant. It is also nearly allied to *C. contraria*, but is usually much larger, with stouter stems and longer and more rigid branchlets. In habit it much resembles a slender state of *C. hispida*. *C. aculeolata*, Kuetz., is generally quoted as a form of this species, but the figure in Tab. Phyc. much more closely resembles *C. polyacantha*, and Kuetzing's specimen appears to belong to a form intermediate between *C. papillosa* and that species.

C. papillosa occurs in Europe, chiefly in the Central and Western districts, having been recorded from Norway and Sweden to Spain and Turkey. It has also been found in North and South America. It was collected in 1884 (by H. G.) in a broad near Potter Heigham, East Norfolk, but without fruit; and last summer we again found it in the same locality, although very sparingly, with young fruit, as shown in our plate. It will be seen by the long branchlets of the lower whorls that our representation is taken from a young plant. The ripe nucule is drawn from a Swedish specimen.

C. CONTRARIA, Kuetz. — Oxon, Oxford, 1885, *G. C. Drnce*; Galway E., Lough Derg, 1885, *E. F. & W. R. Linton*.

var. *hispidula*.—Mayo E. & Galway W., Cong, 1885, *C. Bailey*.

C. HISPIDA, L. — Wilts N., 1885, *G. C. Druce*; Hereford, 1885, *A. Ley*.

C. VULGARIS, L. — Norfolk W., 1885, *A. Fryer*; Carmarthen, 1885, *O. Nordstedt*; Limerick, 1885, *S. A. Stewart*; Clare, 1885, *R. P. Murray*.

var. *longibracteata*.—Somerset S., 1884, *R. P. Murray*; Lincs. N., 1884, *H. Searle*.

var. *papillata*.—Cheshire, 1885, *H. Searle*.

var. *crassicaulis*.—Hunts., Ellington, 1884, *W. R. Linton*.

LYCHNOTHAMNUS STELLIGER, Braun (*C. obtusa*, Desv.). — Surrey,

Walton-on-Thames, 1885, *H. G.* An interesting connecting link between the previous records of Norfolk and Devon.

TOLYPELLA GLOMERATA, Leonh.—Suffolk E., nr. Yarmouth South Town, 1885, *H. & J. G.*; Bedford, 1884, *Mr. Davis*, comm. *J. Saunders*; Caithness, Wester Loch, 1885, *J. Grant*, comm. *A. Bennett*. The Caithness plant is a small form which, from the specimens we have seen, appears to bear the same relationship to *T. glomerata* that *T. Normaniana* does to *T. nidifica*.

T. INTRICATA, Leonh.—Hunts, St. Neots, 1885, *W. R. Linton*.

NITELLA TRANSLUCENS, Ag.—Sutherland E., Lochinver, 1885, fide *Dr. O. Nordstedt*; Kerry S., Killarney, 1885, *E. F. & W. R. Linton*.

N. FLEXILIS, Ag.—Staffs., Rudyard Lake, 1884, *H. Searle*, comm. *A. Bennett*; Notts., near Worksop, 1885, *H. Searle*; Mayo E., Cong, 1885, *E. F. & W. R. Linton*.

N. OPACA, Ag. — Hants N., 1885, *Miss C. E. Palmer*; Kerry S., 1885, *R. P. Murray*.

N. CAPITATA, Ag., Syst. Alg. (1824), p. 125; Wallm., Act. Stockholm, 1852 (1854), p. 265, *ex parte*; Wahlst., Skand. Char. (1862), p. 8; Monog. Sver. Norg. Char., p. 15; Nordst., Bot. Notiser, 1863, p. 34; Rabenh., Krypt. Flor. Sachs. (1863), p. 287; Leonh., Oesterr. Arml. (1864), p. 47; Braun, Consp. Char. Europ. (1867), p. 1; Monatsb. Akad. Berl., 1867, p. 801; Fragmente Monog. Char., p. 31; Sydow, Europ. Char. (1882), p. 12.

C. capillaris, Krocker, Fl. Siles., iii. (1814), p. 62, *fide* Braun.

C. capitata, Nees, Denkschr. Baier. Bot. Gesellsch., 1818, p. 80; Braun, Ann. Sci. Nat., 1834, p. 352.

C. elastica, Amici, Descriz. di alc. sp. nuove di Chara (1827), p. 9; tab. i., figs. 2 & 3, tab. ii. (extr. Mem. Acad. Modena).

N. syncarpa, var. *glæocephala*, Kuetz., Phyc. Germ. (1845), p. 256.

C. syncarpa, var. *capitata*, Gant., Oesterr. Char. (1847), p. 9 (*ex parte*).

Exsicc. — Braun, R. & S., 26, 27, 28, 104; Nordst. & Wahlst., 3, 4; Desmaz., Pl. Crit. Fr., 319; Areschoug, Alg. Scand., 300; Billot, 1986–7.

Stem slender. Whorls of 6–9 (usually 8) branchlets. Fertile whorls usually in small compact heads, more or less enveloped in mucilage. Branchlets once divided into 2–4 one-celled acuminate secondary rays. Secondary rays equalling or shorter than the primary ray. Nucules usually two or three together, shortly ovoid, round in transverse section, 6–7 striate; nucleus, when ripe, black or nearly so, with sharp and prominent ridges. Globules large. Dicœcious. Tab. 264.

This exceedingly beautiful species is most nearly allied to *N. opaca* among our British Nitellas, but may be at once distinguished by the mucilage enveloping the fertile heads, and the more slender habit. It is generally distributed in Europe, but we have no records of it from Russia or the Iberian Peninsula. It has also been found in North Africa, Asia, and North America. *N. capitata*

was discovered last spring by our friend, Mr. Alfred Fryer, in some of the Wash ditches near Sutton, Cambridgeshire. It is very gratifying that the discovery should have been made by this enthusiastic botanist, who has done so much towards working out the Flora of the Fen country.

As stated in our Review, Braun referred specimens from Llyn Idwal, Killarney, and Stowting to this species. We have had an opportunity of examining fresh specimens of the Llyn Idwal *Nitella*, collected by Messrs. J. E. Griffith and H. Groves, but find no trace of any mucilage.

Mr. Fryer has sent us specimens of the peculiar monœcious *Nitella* referred to in our Notes for 1884 (Journ. Bot., 1885, p. 83), collected in West Norfolk; we are not, however, yet in a position to offer a definite opinion upon it.

ON THE RELATION OF THE BRITISH FORMS OF RUBI TO THE CONTINENTAL TYPES.

By J. G. Baker, F.R.S.

The subject of the relationship of the British forms of Rubi to the continental types is one of great interest. It is only in Central and Western Europe that the fruticose Rubi appear in any considerable quantity, and we have in Britain so few endemic flowering plants that anything that bears that appearance puts in a strong claim on our attention. The table of European Rubus-forms and their distribution, given by Nyman in the first part of his 'Conspectus' (1878), embodies the results of the labours of Dr. Focke, as worked out in detail in his "Synopsis Ruborum Germaniæ" of 1877. Dr. Focke has studied the German Rubi much more fully and with a greater command of material than any of his predecessors, and the result is a great advance in the delimitation, definition, and classification of the Central European forms. We shall now have to revise our ideas of the mutual relationship and nomenclature of the British brambles in the light thrown upon them in these two works. But at present this is a task of great difficulty. I know of at least two first-rate botanists who have tried to check off in Nyman the types which we possess in Britain, and who have given up the task in despair. In the present paper I propose to make a first attempt at doing this, in the hope that others will follow it up and improve upon it. I made an attempt to do this during my holiday this autumn, and although the results are very far from complete or satisfactory, yet I think I had better report on the subject whilst it is fresh in memory. The material on which I worked was got together as follows:—First, in company with my brother and son, I stayed at Spa for a few days and made a collection there of all the brambles I saw. Then we went up the Rhine, the two points from which we had an opportunity of making

country excursions being Konigswinter and Heidelberg. After coming back to England I took, accompanied by Mr. Newbould and my son, several walks in the north of Surrey, to hunt up bramble-stations for Mr. Beeby. The three sets thus obtained, the English, the Belgian, and the German one, I asked Dr. Focke to examine and report upon, and he has now most kindly done so. What I propose to do in the present paper is to go through the list in Nyman *seriatim*, and to place our English forms under his types as accurately as the material which I have at command will enable me to do. My list does not pretend to be exhaustive, and is mainly confined to the British forms which I have myself seen growing.

There are two difficulties at the outset to be encountered, in adjusting to Nyman's the British catalogue of forms. Nyman's list throughout runs nearly parallel with Focke's, with one important exception. The groups are the same as in Focke, except that the large central group of the *Adenophori* quite disappears. Some of the forms classed by Focke as *Adenophori* are mentioned by Nyman under other groups, as, for instance, *chlorothyrsos*, *Gremlii* and *Leyi* are placed by Nyman under *silvaticus* in the *Villicaules* group, but several of Focke's other *Adenophori*, as, for instance, our most satisfactory British representative of the group, the *Rubus infestus* of Weihe and Nees, I cannot trace in Nyman anywhere. I cannot help suspecting some printer's mistake has occurred, and that a slice of the list has been accidentally dropped out. The group *Adenophori* in proper sequence should come on page 218 in Nyman, between the *Tomentosi* and the *Vestiti*.

The other difficulty which I find in dealing with Nyman's catalogue is that Genevier's labours on the West French forms are hardly at all taken into account. In Genevier's 'Essai monographique sur les Rubus du bassin du Loire,' which was published in 1869, 203 species are named and defined. It is only reasonable to suppose that the West French forms will in many cases fit in better with ours than those of Central Germany, but at least half the names employed by Genevier are not included in Nyman at all. The task of adjusting the French to the German nomenclature still remains to be performed.

In the following list the groups and numbers are followed as they stand in Nyman's enumeration.

Idæobatus *Focke*.

1. *Rubus Idæus* has a very wide European distribution. I found the ordinary *Idæus* just as plentiful about Spa and along the Rhine as it is in the south-west of Surrey or in the English lake district. I have a German specimen from Bamberg, gathered by Koehler, given me by Dr. Focke, which entirely agrees with our English *Leesii*, and another (var. *sterilis* Koehler) which is intermediate between this and the type. There has been considerable correspondence about *Leesii* lately, in the 'Gardeners' Chronicle' (Gard. Chron. xx. (1883) pp. 12, 150, 214, 276 and 342), and a figure (tab. 3) has been given from a specimen sent by a neighbour

of mine in Yorkshire (Mr. Culverwell, of Bedale), who believed that he had produced it by hybridisation between the Raspberry and the Strawberry!

Eubatus *Focke*.

Group. 1.—*Suberecti*.

2. *R. suberectus*.—What I have from Dr. Focke as *suberectus* and *fissus* completely agree with what we understand by those names in England. We found undoubted *suberectus* this autumn in small quantity in the lane between 'Wheat Sheaf Inn' and Virginia Water station, which is the first satisfactory Surrey station I have seen.

3. *R. sulcatus* Vest. — Of this I have seen several dried specimens, but have not gathered it. It differs from *suberectus* by its more elongated inflorescence and by its stouter prickles and stalked lower leaflets. As it extends from Germany to Norway and Sweden it is not unlikely to occur in Britain.

4. *R. plicatus* W. & N.—Here, again, the continental plant, which I saw growing copiously about Spa and in the Neckar Valley, entirely agrees with what we call by this name in Britain.

5. *R. nitidus* W. & N.—This recedes from *plicatus* in the direction of *rhamnifolius*. Dr. Focke gives it as British on the authority of Devonshire specimens from Mr. Briggs. Long ago Genevier told me the same thing about this Devon plant, of which my two specimens were collected, both by Mr. Briggs, one in an open place in a wooded valley at Ivybridge, in June, 1865, and the other on waste heathy ground above the Combe at Egg Buckland in June, 1868. I have myself seen similar forms near Witley in Surrey and in Woolmer Forest in Hampshire. The plant is well figured in the 'Rubi Germanici' (tab. 4.)

6. *R. affinis* W. & N.—What Dr. Focke and other German authors seem to understand by this name ('Rubi Germanici,' tab. 3), is a robust-growing type closely allied to the preceding, not what we have been calling *affinis* in England, which belongs to the *Rhamnifolii*.

R hemistemon Muller.—This is not mentioned in Nyman, but judging from my specimens from Bloxam and Bagnall, it is a distinct type, belonging to the present group. There is a full description in Genevier's Monograph, and it is represented by specimens (No. 3.) in the beautiful series of Vosgesian Rubi issued by Abbé Boulay.

Group 2.—*Rhamnifolii*.

This group, which consists of the arching Rubi with glabrous barren stems and equal prickles, seems to be much more abundant both in forms and individuals, in Britain, than in Belgium or Germany.

7. *R. carpinifolius* W. & N.—This is given as English by Nyman, but I have not been able to individualise it clearly as a British plant. Dr. Focke regards as *carpinifolius* the only rhamnifolian bramble I collected in the neighbourhood of Spa. Wirtgen's

montanus I had an opportunity of seeing alive, both the type and the variety *heteroclitus*, on the basalt hills of the Siebengebirge. As has been already indicated by Professor Babington, it seems to me that the British form which we have been calling *affinis*, which is the common rhamnifolian bramble of North Yorkshire, and occurs also abundantly in the Lake District and reappears in the New Forest and about Bournemouth, but which I have never seen about London, is not in any way essentially different from *montanus*, and that we ought to look upon this as the British representative of this present type. I believe the well-known *R. laciniatus* of gardens is a cut-leaved form of the same plant. Nyman and Focke classify here the *R. Grabowskii* of Babington, which they consider to be quite different from the original German *Grabowskii* of Weihe. My own impression of Bloxam's *Grabowskii* is that it comes in somewhere between *pubescens* and *infestus*, and not among these *Rhamnifolii*.

8. *R. vulgaris* W. & N.—The type is not given as British by Nyman, and I know it only from two or three dried specimens and the figure in 'Rubi Germanici.' It seems to me to approach closely to our English *R. ramosus* Bloxam, but about this I know too little to speak with confidence. According to Focke, *R. macroacanthus* W. & N., belongs here, so that it must be entirely different from Bloxam's plant so-called. *R. Lindleianus* Lees, is a type that is very interesting from a geographical point of view. In Britain it is one of our most widely-spread and best-marked Bramble-types, and yet till very lately it was entirely unknown on the Continent. Dr. Focke has kindly sent me a specimen gathered by himself this year, near Oldenburg, I think all our British batologists would be in favour of keeping up *Lindleianus* as a distinct subspecies.

9. *R. rhamnifolius* W. & N.—This is not recognised as British by Nyman, but cultivated specimens of the Minden plant, figured 'Rubi Germanici,' tab. 6, given me by Focke, agree fairly well with the British type as distributed by Bloxam. I believe that this No. 9 will be found to represent one of our most widely-diffused and variable British types. The commonest bramble of the Surrey heaths, which has been always called *cordifolius*, is identified by Dr. Focke with the North German *R. Mausii* and the Pomeranian *R. Muenteri*. The original *cordifolius* Dr. Focke looks upon as a very rare endemic German type receding from *rhamnifolius* in the direction of *thyrsiflorus*.

Besides these three we have in Britain under this section at least two distinguishable forms not mentioned by Nyman, viz., *R. incurvatus* Bab., which comes in between *rhamnifolius* and *villicaulis*, and *R. imbricatus* Hort, which Professor Babington now approximates to *ramosus*, but which Mr. Briggs finds in the neighbourhood of Plymouth to quite maintain its distinctness.

(To be continued.)

ON THE FLORA OF THE UPPER TAMAR AND NEIGHBOURING DISTRICTS.

By the Rev. W. Moyle Rogers, F.L.S.

The districts treated of in this paper may be defined as follows :—

I. The seaboard for between 20 and 30 miles from Morwinstow to Trebarwith Sands, with the road along the high ground from Kilkhampton to Launceston as eastern limit. Much of this, including Morwinstow at one end and Launceston at the other, are left untouched by me.

II. The valley west of the Tamar, from its source near Wooley Barrows to Launceston, including both sides of the Launceston and Kilkhampton Road. Here the country chiefly examined is between Kilkhampton and Whitstone.

III. The tract north-east of Launceston and east of the Tamar and drained by its tributaries on that side.

IV. The country drained by the Waldon and other south-western tributaries of the Torridge, to the left bank of the Okement. The railroad from Holsworthy to Okehampton is constructed along the watershed of the Tamar and Torridge, and thus forms a partial boundary between Districts III. and IV.

I. and II. are in East Cornwall; III. and IV. in North Devon. All the N. Devon records have been made in the course of the four years 1882 to 1885; a large proportion of them (including many of the most interesting) by Mr. T. R. Archer Briggs, during short visits to the house which I have just left in Bridgerule, and the rest by myself. Of the E. Cornwall records Mr. J. G. Baker's bear date 1871 (see his paper in Journ. Bot., April 1873); Rev. W. M. Hind's 1872 (see Journ. Bot., Feb. 1873); Mrs. Kennedy's 1883 to 1885; Mr. E. A. Webb's 1885; and the rest (Mr. Briggs' and mine) 1882 to 1885. Where a year follows a locality it is the date of what I believe to be the first record for the species in the vice-county.

Tackbeare and Newacott are the names of *houses* in E. Cornwall; as Parnacott, Hollaton, Southlands, Tatson, Leworthy and Worthen are in N. Devon. Some of the other names given, as, *e.g.*, Grimscott, Burrow, Derriton and Tinney, are those of very small hamlets which will be found in any fairly good maps of Devon and Cornwall. In every case the Tamar is here regarded as the county boundary. Hence the frequent occurrence of the name Bridgerule in District II., as well as in District III., the river dividing the parish (now reckoned as wholly in Devon) into almost equal portions. The most marked features of the Flora are the unusual abundance of wet-land plants and a corresponding absence or great rarity of all species loving dry ground, the whole district eastward to Dartmoor being saturated with moisture nearly all the year round. This applies least to the actual seaboard. Hence the greater richness of the Flora in District I., and its extreme poverty

(numerically) in the high moorland tract stretching from Holsworthy almost to Okehampton. Thus in four years I have neither found nor had reported to me from any of the districts a single specimen of *Papaver Argemone*, *Arabis thaliana*, *Lychnis vespertina*, *Scleranthus annuus*, *Galium Cruciata*, *Filago minima*, *Inula Conyza*, *Tragopogon pratensis*, *Campanula rotundifolia*, *Orobanche*, *Echium vulgare*, *Aira flexuosa* and *Melica uniflora*; while I have none but E. Cornwall localities (and those chiefly in District I.) for the following:—*Papaver Rhœas* and *dubium*, *Draba verna* and *brachycarpa*, *Viola hirta*, *Saxifraga tridactylites*, *Torilis nodosa*, *Galium verum*, *Centaurea Scabiosa*, *Salvia Verbenaca*, *Myosotis collina*, *Sclerochloa rigida* and *Bromus asper*.

Species of no particular interest which I have found to be really common in all the districts (or in such portions of all as have been visited by Mr. Briggs or myself) will be given *without localities*. Other species, usually common elsewhere, but which I have not clearly ascertained to be so in this part of the country, will have an account of their distribution given. The sign ! placed *after an authority* implies that I too have seen the plant in the locality given.

Clematis Vitalba L. I. Near Bude. Poughill (Hind!). Only in two or three spots. Denizen.

Anemone nemorosa L. I. Reported to me as abundant in wood at Stamford Hill, Stratton; and in one place by road between Stratton and Launcells. III. Bridgerule Vicarage Plantation; planted many years ago, but still in small quantity. Also reported from woods between North Tamerton and Tetcott.

Ranunculus peltatus Fries (a. *truncatus* All. ?). II. and III. In canal and the Tamar; frequent.—*R. diversifolius* Gilib. I. Stream side, Summerleaze Down, 1882.—*R. intermedius* Hiern, Mon. I. Greena Moor. III. "Drove" between Tinney and Worthen, 1883. Bridge Moor, in several places. Pyworthy, near the Holsworthy and Stratton Road, in two places. Near Dunsland Cross Railway Station. IV. Hillside south of Okehampton (with *R. Lenormandi*) by rill. Usually on mud or in very shallow water. Petals frequently 5-veined and as large and as white as those of *R. Lenormandi*. Both species are in flower for quite half the year, several weeks earlier and several weeks later than *R. hederaceus*.—*R. Lenormandi* F. Schultz., *R. hederaceus* L., *R. Flammula* L. (type and b. *pseudo-fluitans*), *R. acris* L., *R. repens* L., *R. bulbosus* L.—*R. parviflorus* L. I. Poughill. Summerleaze Down. Widmouth Bay. Boscastle. Trebarwith. II. Littlebridge and near Newacott. Sparingly in all these localities, and not at all in III. and IV.—*R. Ficaria* L.

Caltha palustris L. I have found b. *Gueranyerii* with type in two places in Bridgerule (III.).

Helleborus viridis L. I. "Orchard near Parsonage, Kilkhampton, together with *Polygonum Bistorta*, *Geranium phæum* and *Petasites vulgaris*" (Mrs. Kennedy, *in lit.*). Week St. Mary (orchard). III. Bridgerule Vicarage Plantation, one large and increasing patch.

Aquilegia vulgaris L. I. About Kilkhampton, frequent (Mrs. Kennedy). Marhamchurch. Lesnewth Valley. Rare generally, but perhaps native in this district. III. Bridgerule, in two or three spots, but only where it seems to have escaped from cultivation.

Berberis vulgaris L. IV. Near Bradworthy. Near Okehampton. Denizen.

Papaver Rhœas L. I. Here and there from Bude to Trebarwith, becoming locally abundant south of Boscastle. Searched for in vain in the other districts. [*P. somniferum* L., as alien in some quantity near Bude]. *P. dubium* L. — I. Near Bude, rather frequent, both forms. Boscastle and Trebarwith (*Lamottei*).

Chelidonium majus L. III. Bridgerule Churchyard hedge. IV. Near Okehampton.

Corydalis lutea DC. Alien. I. Boscastle and Trevalga; established in some quantity.

Fumaria confusa Jord. I. Bude. Minster Valley. Boscastle. Trebarwith. II. Near the quarry, south-west of Tackbeare. III. Bridgerule. Clawton. Uncommon. — *F. officinalis* L. I. Bude (Hind). Boscastle, abundant. I believe quite rare.

Sinapis arvensis L., *S. alba* L. I. Bude, rape-field by Marhamchurch Road. II. Newacott, in potato-field in great quantity in 1885.—*S. nigra* L. I. Near Bude. Marhamchurch and Boscastle. III. Church Lane, Bridgerule. one plant, 1885, casual.

Brassica Rapa L., c. *Briggsii*. I. Launcells. Boscastle. II. and III. Bridgerule. Rather frequent colonist (See Mr. Briggs' note on this in Journ, Bot. 1873, pp. 99, 100).

Diplotaxis muralis DC. I. Poughill. Bude (Hind!) frequent.

Sisymbrium officinale Scop. *S. Alliaria* Scop.

Cardamine pratensis L. *C. hirsuta* L. *C. sylvatica* Link.

Barbarea vulgaris Brown. *B. præcox* Brown. I. Marhamchurch. Burrow. Boscastle, frequent. II. Near Newacott. Werrington. III. Bridgerule. IV. Near Bradworthy. Denizen or colonist. Rather rare.

Nasturtium officinale Brown.

Cochlearia officinalis L., a. *littoralis*. I. Coast, common. II. Launceston and Kilkhampton Road, about half a mile beyond Burrow Cross and five or six miles from sea, several plants. III. Near Holsworthy, (about nine miles from sea) on hedgebanks of kitchen garden and on opposite side of road, in great quantity. Near Clawton, under like circumstances. IV. By the Waldon, near Bradworthy, in fair quantity (not near house or garden now). The occurrence of this maritime plant in so many inland places seems to point to its former cultivation in this neighbourhood.—*C. danica* L. I. Coast, common. Stratton.

Draba verna L. I. Bude, abundant (type and b. *brachycarpa*). Not seen elsewhere.

Capsella Bursa-pastoris Mœnch.

Lepidium campestre Brown. Colonist. Rare. I. Sandymouth, field margin near edge of cliff (E. A. Webb). Poughill (Hind). IV. Cornfield, Bradworthy.—*L. Smithii* Hook. A common native.

Senebiera didyma Pers. I. Stratton (Hind !).—*S. Coronopus* Poir.

[As aliens. *Armoracia rusticana*. I. Boscastle. — *Alyssum maritimum* Br. I. Bude. — *Lepidium sativum*. I. Boscastle].

Reseda Luteola L. I. Marhamchurch (Hind).

Viola palustris L. *V. odorata* L. I. Near Kilkhampton, rare (Mrs. Kennedy). Poughill (Hind!), in considerable quantity, in sunny lane. Also between Bude and Stratton and in two or three other spots about Bude and Stratton. Perhaps native. II. and III. In several places, but always as denizen.—*V. hirta* L. I. Near Bude. — *V. sylvatica* Fries, a. *Riviniana*. I have looked in vain for *Reichenbachiana*. — *V. canina* Auct. I. Sandhills, Bude(Hind!) and Widmouth Bay; frequent.—*V. lactea* Sm. I. Greena Moor, abundant. II. Moor south of Merrifield. III. Affaland Móor. Moors near Dunsland Cross, in good quantity, 1883. IV. Near Okehampton. Last June I found this violet near Molland, close to the Somerset border. No doubt it will be found in Somerset. —*V. tricolor* L. (usually var. *arvensis*).

Drosera rotundifolia L. Common, but the only species seen.

Polygala vulgaris L. I., II., III. Rather common.—*P. oxyptera* Reich. I. Widmouth Bay; with remarkably small sepals. — *P. depressa* Wender. The commonest form.

Saponaria officinalis L. I. Bude (Hind!). Alien.

Silene inflata Sm. I. Fairly common (b. *puberula*, Bude). II,, III., IV. Generally though very sparsely distributed. — *S. maritima* With. I. Frequent as a maritime plant.

Lychnis diurna Sibth. *L. Flos-cuculi* L. — *L. Githago* Lam.— III. Bridgerule: "Bridge Park" (1884); Southlands (1885). IV. Sutcombe. Apparently rare.

Mœnchia erecta Sm. IV. Hillside south of Okehampton, 1882.

Cerastium tetrandrum Curt. I. "Coast, Bude" (Hind!) and elsewhere, common. Stratton, on wall-top.—*C. semidecandrum* L. I. Poughill (Hind) and Bude, abundant.—*C. glomeratum* Thuil.—*C. triviale* Link.

Stellaria media With.—b. *Boræana*. I. Bude sandhills. III. Near Furze Farm, Bridgerule. — d. *umbrosa*. II. Bridgerule, in two or three spots. III. Bridgerule, in several spots. Near Parnacott, warm bank by canal. Shuns exposed places. — *S. Holostea* L. —*S. graminea* L.—*S. uliginosa* Murr.

Arenaria trinervia L.—*A. serpyllifolia* L. I. Bude, c. Stratton. —b. *leptoclados*. I. From Boscastle to Trebarwith, fairly frequent. IV. Near Okehampton. I have not been able to find a plant of either type or var. between Stratton and Okehampton.

Sagina maritima Don. I. Bude (Baker!). Boscastle. Tintagel. Trebarwith. — *S. apetala* L. I. Kilkhampton (Mrs. Kennedy). Bude. Stratton (Hind!). Marhamchurch. Boscastle. III. Bridgerule Churchyard. Rare. — *S. ciliata* Fries. I. About Boscastle, abundant. Trebarwith. IV. Near Okehampton. — *S. procumbens* L. — *S. subulata* Wimm. I. Boscastle. Valley of Rocks. Hill above Trebarwith. IV. Near Okehampton.—*S. nodosa* Meyer. I. Bude (Hind!) II. Canal banks, Bridgerule.

Spergula arvensis L.

Spergularia rubra Fenzl. I. By quarry near Forrabury Church.

By quarry, St. Stephens, near Launceston. III. By Reservoir. about four miles from source of Tamar.—*S. neglectum* Syme. I. Bude, beach (Baker!); also, in plenty, in salt marsh and on Efford Down. Widmouth. Wanson Mouth. Boscastle. Trebarwith.—*S. rupestris* Lebel. I. Along the coast from Sandymouth to Tintagel, abundant (? = Dr. Hind's "*Lepigonum marinum* Wahlb., coast, Bude").—*S. marginata* Syme, seems absent from this coast of rock and sands.

Montia fontana L.

Tamarix anglica Webb. I. Bude, planted.

Hypericum Androsæmum L. — *H. perforatum* L. — *H. dubium.* Leers. I. Kilkhampton (Hind). II. and III. Bridgerule, rather frequent. — *H. tetrapterum* Fries. — *H. bæticum* Boiss. Common along the whole course of the Upper Tamar, and from the coast to Bradworthy, Sutcombe, and the moors about Dunsland Cross. — *H. humifusum* L. Generally but rather thinly distributed. — *H. pulchrum* L.—*H. Elodes* L.—*H. elatum* Ait. Alien. III. Hollaton and Bridgerule Vicarage Plantations.

Lavatera arborea L. I. Frequent on coast, but only where planted.

Malva moschata L. *M. sylvestris* L.—*M. rotundifolia* L. I. Widmouth, Boscastle.

Radiola Millegrana Sm. I. Kilkhampton (Mrs. Kennedy). Greena Moor. Very abundant in Lesnewth and Minster Valleys. III. and IV. Frequent.

Linum catharticum L. — *L. angustifolium* L. I. Frequent. II. Launceston and Kilkhampton Road, occasionally. III. By Reservoir. Bridgerule. Pyworthy. Holsworthy. Clawton. Lifton. Local. — *L. usitatissimum* L. III. Casual in several places, from 1882 to 1885.

Geranium sanguineum L. I. Quarry near Forrabury Church, one large plant (1885), garden outcast.—*G. phæum* L. Alien. I. Kilkhampton, orchard near Parsonage (Mrs. Kennedy). III. Bridgerule Vicarage Plantation. Tetcott Rectory orchard, in great quantity.—*G. pyrenaicum* L. Denizen. I. Bude, grass field, one plant (1882). Widmouth, field by "Villa," in plenty.—*G. molle* L. — *G. pusillum* L. I. Bude. — *G. dissectum* L. — *G. columbinum* L. Rare. I. Cliffs above Sandymouth. Summerleaze Down. Lane near Stratton (Webb). Hoppicott Down, one plant (1884). III. Roadside between Lifton and Bridestowe. IV. Near Okehampton. —*G. Robertianum* L.

Erodium cicutarium Herit. I. Bude (Hind!). Widmouth. — *E. moschatum* Herit. I. Poughill, garden wall-top. Bude (Briggs and Baker!). Summerleaze Down, in great quantity. Widmouth Bay. Native.—*E. maritimum* Sm. I. Bude. Minster Valley, to perhaps a mile inland. Boscastle to Tintagel, frequent.

Oxalis Acetosella L.

Ilex Aquifolium L.

Euonymus europæus L. I. and II. Frequent. III. Bridgerule. Pyworthy. Between Tinney and North Tamerton. Tetcott; uncommon. IV. Sutcombe, several bushes in one place.

Rhamnus Frangula L. I. Remarkakly common. Dr. Hind's list, omitting this, gives "*R. catharticus* L., Lansells," a species not otherwise reported on good authority for either Devon or Cornwall (see Mr. Briggs' note, Journ. Bot. 1873, p, 100).

Acer campestre L. I. Near Kilkhampton, some fine trees on the Thurdon Road (Mrs. Kennedy). Between Stratton and Launcells. Marhamchurch (Hind!). III. Worthen. Pyworthy. North Tamerton. IV. In two or three spots in the Bradworthy neighbourhood. Very rare, but I think native. [*A. Pseudo-platanus* L. Always planted].

Ulex europæus L. *U. Gallii* Planchon.

Genista anglica L. 1. Near Tackbeare. Week St. Mary (Hind!), Greena Moor. II. and III. Bridgerule and Pyworthy, frequent. IV. Near Okehampton. One of the characteristic moorland plants.—*G. tinctoria* L. I. Boscastle Cliffs, in plenty (b. *humifusa*). II. Between canal and river below Newacott, 1882.

Sarothamnus scoparius Koch. Rare. I. St. Gerrys (Webb). Near Tackbeare. Tresparrot Down (only one bush seen). II. Quarry by canal above Bridgerule (one bush). Near Wilsworthy Moor (one bush). IV. Near Okehampton.

Ononis arvensis Auct. Only locally common.

Anthyllis Vulneraria L. I. Type and var. *Dillenii* abundant along the coast from Sandymouth to Trebarwith.

Medicago lupulina L.

Melilotus officinalis Willd. I. Stratton (Hind). — *M. arvensis* Willd. I. Kilkhampton (Hind).

Trigonella ornithopodioides DC. I. Rocky ground near Forrabury Church, in great quantity. Valley of Rocks.

Trifolium pratense L. *T. medium* L.—Remarkably common. — *T. arvense* L. I. Willa Park Point. Tintagel Head (Hind). — *T. striatum* L. I. Stratton and Launcells Road. Boscastle, abundant. Trebarwith, on the sides of the cliffs with the next, but giving place to it altogether on the cliff-tops. — *T. scabrum* L. I. All along the coast in great quantity. *T. hybridum* L. I., II., III. A frequent roadside alien.—*T. repens* L.—*T. fragiferum* L. I. Northcot Mouth (Mrs. Kennedy). Bude (Hind!). Summerleaze Down. Roadsides between Marhamchurch and Bridgerule, in two places. Widmouth, abundant. *T. procumbens* L. — *T. minus* Relhan. — *T. filiforme* L. I. Bude, salt marsh. Lesnewth Valley, Boscastle, and Valley of Rocks; abundant. II. Between Launcells and Bridgerule. III. Parnacott. Bridgerule, rather common. Near Clawton. IV. Okehampton.

Lotus corniculatus L. *L. major* Scop.

Ornithopus perpusillus L. I. Near Kilkhampton (Mrs. Kennedy). From Boscastle to Trebarwith, frequent. II. Quarry near St. Stephen's.

Vicia hirsuta Koch. *V. tetrasperma* Mœnch.—I. and II. Fairly frequent. III. Only seen near Lifton. — *V. Cracca* L. — *V. Orobus* DC. I. Greena Moor, rough furzy ground at south-west end, in considerable quantity, in fruit only on Sept. 11, 1883. New County

Record. On Tresparrot Down, about four miles from Boscastle, a small patch in full flower on July 1, 1885. III. Between Reservoir and Bradworthy, among heath; observed for several years past (Mrs. Kennedy). This is probably the same as Mr. Husband's locality, on whose authority it is entered as a N. Devon plant in Top. Bot., Edit. 2. — *V. sepium* L. — *V. angustifolia* Roth. (both a. and b.).

Lathyrus pratensis L.

Orobus tuberosus L. Both type and b. *tenuifolius* remarkably common.

(To be continued.)

ON THE JAMAICA FERNS OF SLOANE'S HERBARIUM.

By G. S. Jenman, F.L.S.

While occupied recently in looking up information on the Guiana Flora at the British Museum Herbarium, I used the opportunity to determine the ferns in Sloane's collection of Jamaica plants.

The plants are contained in eight large folio volumes, and are described, and in part illustrated, in Sloane's 'Natural History of Jamaica.' The ferns form vol. i. of the series. In the course of the examination I found that the figures have been often misquoted, for, though they are characteristic in general features, in many cases essential details are wanting; and I therefore now place on record my determinations, which I have also written on the sheets. Beyond correcting the misquotations alluded to, the result shows that this collection, now two hundred years old, contains several rare and only recently rediscovered species; and, still more interesting, that it contains two unnamed plants.

Sloane's numbers run to one hundred and three, but these include a few flowering plants which he thought to be allied to ferns, and therefore included with them under the designation of *Phyllitidi Scandenti Affines:* a few ferns are included elsewhere in the 'History.' There are also of the fern-allies a *Selaginella* and *Equisetum*. A few of the number were collected by James Harlow, gardener to Sir Arthur Rawdon, who was sent to Jamaica by the latter to bring live plants of the specimens which Sloane had brought home, of which he procured, as detailed in the 'History,' nearly "a ship-load, trees and herbs, planted and growing in earth," and dried specimens. If this statement be taken literally, James Harlow is not only in period of time, but in actual accomplishment, a long way ahead of the most enterprising of his modern successors. A few species from Dr. Houston are also intercalated by Sloane in his herbarium, but not numbered on the sheets. Dr. Houston went to the West Indies in 1728, and died in Jamaica in 1733. Those mentioned as collected by Harlow were probably the first West Indian ferns introduced alive to European gardens. The plants were grown at Sir Arthur Rawdon's place at Moyra, Ireland, and, after Sloane had supplemented his collection

from them, transferred to Oxford, and Bobart employed them in Morison's 'History of Plants,' which he edited.

Sloane left England for Jamaica in September, 1687, as physician to the Duke of Albemarle, who had just been appointed governor of that island, but who died, unfortunately for Sloane's designs, in December, immediately after their arrival. Sloane had long cherished the desire to visit the West Indies, with the view of studying their natural history, the character of which, like almost everything pertaining to the New World, was much exaggerated, even as late as his time. On the death of his patron he determined to prosecute his ardent tastes for a short time, and remained fifteen months collecting, observing, and taking ample notes. His 'History,' though written subsequently, and the collections he made, are evidence of the wonderful industry he displayed during this brief period. But this was only the beginning of the labours in natural science which have made his name renowned. The time was chiefly spent in Jamaica, but he visited as well Barbadoes, Nevis, and St. Kitts, returning with Lady Albemarle in the spring of 1689. He brought with him about 800 specimens of dried plants, "and showed them very freely to all lovers of such curiosities."

Sloane was deservedly one of the most celebrated of the scientific men of his day. Learned societies conferred their titles and distinctions upon him, and his company was sought by the most distinguished of his contemporaries and rivals. In 1696 his 'Catalogue of Jamaica Plants' was published. In 1707 the first volume of the 'Natural History' appeared, and the second volume in 1725. Before his death, which occurred in 1753, in his 92nd year, Sloane reckoned the objects of Natural History he had acquired as upwards of 30,000, besides 200 vols. of plants; and his library numbered 50,000 vols., all of which, under a certain stipulation for the benefit of his heirs, he bequeathed to the nation. Sloane's collections in Jamaica having been the foundation of these immense collections, Jamaica has a close and interesting connection with the establishment of the British Museum.

The following is the chief part of Sloane's preface to his chapter on the ferns, which I quote for its interest as containing his system of classification. I offer no apology in directing attention to this old author. No one can turn over his most interesting pages without deriving instruction; and the result of my examination of his ferns shows how profitable it is to go back to the types of the older authors, in which the British Museum is most enviably rich. Though two hundred years old, most of Sloane's specimens are in excellent condition. Some are a little damaged, where the sheets are larger than the volumes and folded, but most of them appear, but for the ancient character of the paper on which they are glued, as if they might have been gathered within the last decade. The third chapter of the first volume, which is entirely devoted to the Filices, is headed, "Of Ferns or Capillary Plants." It begins:—

"The Tribe of Ferns in Jamaica are very numerous, and strange in their manner of growth. Many of them are Scandent, more than one white on the Back; some have Trunes like other Herbs or Trees, and some perfect Stalks.

But whatever they are, they shall by me be ranged as those of Europe are by Mr. Ray, according to the divisions of their Leaves: and whereas it is commonly held that no Fern has, properly speaking, a *Caulis* or Stalk, yet it will hereafter plainly appear they have. To avoid a great deal of trouble in the disposition of them, I shall consider the Stalks of those Climbing Ferns only as Roots. The divisions of the Leaf its self arising from such Stalk shall determine its place without having regard to this Stalk, which ought otherwise to be first taken notice of in the division. Without doubt all hereafter named Ferns are such: only there are six I call *Phyllitidi Scandenti Affines*, which I am not sure are Ferns, and therefore not having seen their Seeds, I give them this, till a better place is found. The name *Trichomanes* shall signifie with me the second divided Fern with broad small Leaves, and the word *Lonchitis* those with longer, though they agree not in every particular with the Europeans. The general division are, first, those with undivided Leaves. Secondly, Those with once divided into *Pinnæ* only, then into those with the middle Rib, a Twig or *Surculus*, and on it *Pinnulæ*, which I call *Filices non Ramosæ;* and the third is the ramose kind. Many of these Ferns are indented about the edge when young, and afterwards are plain with a ferruginous Welt on the outside, and sometimes they are sinuated; many other Varieties there are, appearing really differing Plants, which may be easily found out by any, who considers their several descriptions."

It is true, as Sloane says, that "Ferns in Jamaica are very numerous, and strange"—that is, various—"in their manner of growth." Over four times as many are known now than he knew, and the variation of form is correspondingly greater. Though several extend into the middle and higher regions of the country, nearly all that he gathered are comparatively low altitude species. He was only partly right in regarding the "stalks of those climbing ferns only as roots"—that is, root-stocks; for in the twining kinds, such as *Blechnum volubile*, two Lygodiums, *Hypolepis nigrescens*, *Davallia aculeata* and *fumarioides*, all but one of which he collected, he was wrong. The classification he intended is left rather ambiguous and indefinite. It is based on the divisions of the fronds,—entire, pinnate, bipinnate, &c. He is also somewhat obscure in the use of his terms, *Trichomanes*, *Lonchitis*, *Filices non Ramosæ*, and *Ramosæ*. In going through the plants we shall see how the classification is carried out, but Sloane did not employ his divisional characters as headings to define what species came under each.

The names that I have used in my determinations are those of Hooker and Baker's 'Synopsis Filicum,' in all but a few instances. These precede Sloane's numbers; Sloane's designations follow these, the first few in full as samples of the whole, the remainder in part. I think this necessary, as his initial words have generally a generic or sectional significance, and therefore exhibit his ideas on the affinity of the species. I shall cite the references to his 'Catalogue' and 'Natural History of Jamaica,' but shall omit the synonyms from his contemporaries, which he has quoted very fully. His figures were in many instances cited by Linnæus as types of his species; so that I have given the Linnean and a few other of the post-Sloanean names. Of some of these the plants have been transferred to other genera. Lastly, I quote the numbers of the pages of the folio herbarium volumes. These are numbered, and the designations, with reference to his own works and those of others, written in Sloane's own hand on the pages.

In the 'History' his designations and quotations are followed by a popular description, with the localities, which also I have quoted, where found, and, in some cases, the medical uses, with numerous acrimonious replies of Dr. Plukenet's criticisms.

Anemia adiantifolia Swartz.

1. *Lunaria elatior Adianti albi folio duplici Spica*, Cat. p. 14; Hist. p. 71, Herb. p. 38. *Osmunda adiantifolia* Linn.—Banks of the Rio Cobre.

Anemia hirsuta Swartz.

2. *Lunaria elatior matricariæ folio Spica duplici*, Cat. p. 14; Hist. p. 71, tab. 25, fig. 6, Herb. 39. *Osmunda hirsuta* Linn.—Habitat of the preceding.

Fadyenia prolifera Hook.

3. *Phyllitis non sinuata minor apice folii radices agentea*, Cat. p. 14; Hist. p. 71, tab. 26, fig. 1, Herb. p. 40. *Asplenium proliferum* Swartz; *Aspidium Fadyenia* Mett.—Shady woods at the bottom of Mt. Diabolo.

Polypodium Phyllitidis Linn.

4. *Phyllitidis arboribus innascens folio non sinuato tenuiori rotundis pulverulentis maculis aversa parti punctato*, Cat. p. 14; Hist. p. 72, Herb. p. 41. *Campyloneuron* Presl.—"It grows mostly on the Trunes of great, chiefly old, Trees, as Misseltoe." . . . . . "Sometimes when old Trees fall down, this will then grow on the ground."

Asplenium serratum Linn.

5. *Phyllitis non sinuata*, &c., Cat. p. 14; Hist. p. 71, Herb. p. 42.—A very young state, in which condition the leaves are most deeply serrated, or even lobed.

(6 and 7, are *Asplenium Hemionites* Linn., Cat. p. 14; Hist. p. 72, Herb. p. 42. —Gathered in Madeira by Dr. Sherard, and given to Sloane. *Adiantum reniforme* Linn., plts. p. 44, is from the same island. Neither is Jamaican.)

Hemionitis palmata Linn.

8. *Hemionitis folio hirsuto*, &c., Cat. p. 14; Hist. p. 72, Herb. p. 45.—The description says:—"From the middle Ribs go several transverse Fibers, on which is a great deal of Ferruginous Moss, which is the Seed." Shady banks.

(To be continued.)

A NEW HONGKONG *TEPHROSIA*.

By H. F. Hance, Ph.D., F.L.S., &c.

39203

Tephrosia (Brissonia) **oraria.** — Frutex parvus, novellis flavido-lanatis, ramis angulatis cortice cinereo obductis, foliis impari-pinnatis rachi ferrugineo-hirsuta foliolis 7–8 jugis papyraceis ovali-oblongis basi obtusis apice emarginatis utrinque opacis supra breviter adpressa tomentellis subtus dense tomentosis 15–18 lin. longis 6–10 lin. latis petiolulis 1½ linealibus, racemis ad apices ramulorum sitis fasciculatis multifloris, floribus breviter pedicellatis roseis?, calycis campanulati canescenti-tomentelli dentibus brevibus triangulatis posticis altius connatis, alis carinaque æquilongis glaberrimis vexillo orbiculato emarginato extus minute sericeo,

ovario lanceolato pluriovulato, stylo incurvo complanato intus breviter barbato stigmate brevissime penicillato.

In ins. Hongkong, ad promontorium D'Aguilar, juxta pharum, subgregarie crescentem, m. Dec. 1884, invenit cl. C. Ford. (Herb. propr. n. 22310.)

A very interesting plant, belonging to a section of which there is but a single representative in the whole of our Indian possessions; and which, like most of its allies, differs a good deal by the rigidly coriaceous, acute leaflets. Perhaps the Chinese plant is nearer the Javanese *Kiesera minor* Miq., only known to me from Miquel's diagnosis. Though carefully watched, not a single fruit could be found set on any of the shrubs.

NOTES OF A BOTANICAL TOUR IN WEST IRELAND.

By the Revs. E. F. and W. R. Linton.

Between July 29th and August 19th of this year we visited the principal botanical localities in West Ireland. The following short account of our findings is given in chronological order. We began at Killarney. Owing to the dry season the water of the lake there was unusually low, and therefore very suitable for both the production and collection of water plants. Employing a couple of gaffs supplied us by the boatmen there as dredging apparatus, we got in about five feet of water several interesting things, not mentioned for that locality in the 'Cybele Hibernica.' In close proximity, *i. e.*, in an area of about 20 square yards, on the west side of Ross Island, we secured *Elatine hexandra* DC.; *Callitriche autumnalis* L., which was also plentiful in several other parts of the lake; *Alisma natans* L., root-leaves only. The *Alisma* is apparently in too deep water ever to produce floating leaves or flowers, but propagates itself by runners. Also *Isoetes echinospora* Dur.; this was not plentiful at that spot; *N. opaca* Ag., *N. translucens* Ag., and *Chara fragilis* Desv. On rocks rising 10 feet above the lake near here *Hieracium pallidum* Fries (as named by us) was frequent. *Arbutus Unedo* L., *Euphorbia hiberna* L., and *Hymenophyllum unilaterale* Willd., on the edge of and in the rocky woodland round the lake. From our dredging-ground we rowed on to the far side of Mucruss Lake; here we gathered a few specimens of *Alisma repens* Davies, a delicate pretty plant, and more *Alisma natans*, with floating leaves, in ditches. On the shore of Mucruss Lake were a few bushes of a peculiar *Rosa*, which we gathered with the impression of its being *R. hibernica* Sm. However, it is not that plant, and appears to come nearest to the *spinosissima* group. It has not yet been made out whether or no it is one of the named forms of that species. Returning we landed on a minute rock islet near to our former dredging-place by Ross Island, and found *Pyrus rupicola* Syme, E. B., corroborated by Mr. J. G. Baker, *Rubia peregrina* L., and *Equisetum Wilsoni* Newm., the latter especially growing in great luxuriance and quantity. On Ross Island itself we observed

Myriophyllum alterniflorum DC., *Sparganium minimum* Fries, *Epipactis violacea* D. Dug., and *Equisetum fluviatile* L.; and along the shore west from Ross Castle *Hypericum dubium* Leers., and *Agrimonia odorata* Miller. *H. Androsæmum* L., was noticed in several places. A second day was spent upon the wooded and rocky slopes of Turk Mountain. Here *Saxifraga umbrosa* L., and *S. Geum* L., were obtained. The most prevalent form of *S. umbrosa*, however, was *S. punctata* Haw., typical *umbrosa* with blunt crenations on its leaves being rather scarce. *S. serrata* of Lond. Cat. (*S. serratifolia* MacKay), and *S. hirsuta* L., were also fairly plentiful. By the lake below was growing a form of *Thalictrum minus* L., which appears to be var. *maritimum*.

Leaving Killarney, we came to Dingle, in S. W. Kerry, where we learnt that we were in the next parish but one to America. At Tralee, on the way we observed, in an afternoon stroll, *Statice bahusiensis* Fries, *Œnanthe Lachenalii* Gmel., and in great plenty, by houses along the roadside, *Senebiera didyma* Pers. From Dingle we had a day on Connor Hill and Brandon Mountain. Connor Hill gave us, close to the road, *Saxifraga elegans* Mackay, as well as *S. hirsuta* L., *S. umbrosa* L., and *S. stellaris* L. I should mention here that several Saxifrage forms which were gathered by us seem indeterminable, partaking of the characters which belong to two or three of the "species," viz., *umbrosa*, *Geum*, and *hirsuta*. Whether this is due to hybridism of two different species or to variation of one species might perhaps be settled by cultivation of the several forms. Those who, with Sir J. Hooker, incline to the belief that *S. umbrosa* and *S. Geum* are one species, may see in the above-mentioned fact confirmation of their view. Along with the Saxifrages *Pinguicula grandiflora* Lam., in fruit, was abundant. A plant of *Trichomanes radicans* Swartz., had been gathered here shortly before. On the lower slopes of Brandon we observed *Bartsia viscosa* L., and as we advanced upwards *Caltha minor* Syme, *Alchemilla alpina* L., *Hieracium anglicum* Fries (with a rather unusually leafy stem), being in our judgment the var. *decipiens* Syme, and *Carex rigida* Good., were noticed. But it was only when we got within 300 ft. of the summit that any trace of the hypnoid Saxifrages was met with. Here a few plants of typical *S. hypnoides* L. occurred. Higher up along the ridge the clefts of the rocks were found to be full of *S. Sternbergii* Willd., and close to the top a few patches of *S. cæspitosa* L. were found. There was a noticeable difference in the hairiness of different patches of *S. Sternbergii*; in some the plants were nearly glabrous, in others they were excessively hairy. Very fine *Cystopteris dentata* Hook. was growing here and there on the upper parts of the mountain; *C. fragilis* proper has been found there, but we did not see it, Descending, we came upon *Aira alpina* L., and fine *Saxifraga umbrosa*, var. *serrata* = *serratifolia* Mack., at a considerable altitude, and one or two pools full of *Isoetes lacustris* L.

From S.W. Kerry we passed to Portumna, at the northern extremity of Lake Dearg. On the shore near Portumna a creeping *Helosciadium* was plentiful, which we at first identified with *H. repens* Koch., and it agrees with specimens sent out under that

name some few years back by the Bot. Exch. Club, but differs considerably from specimens of the same received from the Continent. *Teucrium Scordium* was also plentiful all along the south-western shore of the lough. In the lough itself grew *Potamogeton mucronatus* Schrad., *Chara contraria* Kuetz, *C. hispida*, *C. polyacantha* A. Br., *C. fragilis* Desv., and *C. aspera* Willd. On Woodford Racecourse *Sisyrinchium Bermudiana* L. was plentiful, and it occurred also, growing very finely, in a meadow by the side of the Woodford River, which runs into Lake Dearg, on the south side of Rossmore. By this stream also we observed *Hieracium umbellatum* L., a cultivated land *Mentha paludosa* Sole, *M. arvensis* L. form, and in a pond at Rossmore *Potamogeton obtusifolius* M. and K. *Inula salicina* L. was in good flower but very scarce; one plant was found on a rocky isle near Rossmore, a very few others on the shore of the mainland, amid coarse herbage on rocky ground.

From Portumna we came into Connemara. At Oreghtarard we picked up on the shore of L. Corrib fragments of a peculiar close-set form of *Chara aspera* Willd., which Mr. A. Bennett considers may be with one named *C. aspera* f. *marina condensata*. Here also occurred *Scirpus uniglumis* Link. Near Recess we saw *Salix Smithiana*, and in the stream *Potamogeton polygonifolius* Pour., var. *pseudofluitans*, was plentiful, but only in young bud. We also found a curious broad-leaved form of *Ranunculus pseudo-reptans*. Roundstone proved a very interesting locality. On our way there *Menziesia polifolia* Juss. was frequent by the roadside. We made ourselves acquainted with the well-known species of the district, as *Erica Mackaiana* Bab., *E. hibernica* Syme, *Erythræa Centaurium* Pers. var. *pseudolatifolia*, plentiful on the shore at Dog's Bay, *Utricularia intermedia* Hayne (of this we could find no flowers), *Naias flexilis* Rostk. in great quantity in L. Cregduff, and by the same lough, as well as in many other places, *Eriocaulon septangulare* With. A remarkable form of *Carduus pratensis* Huds., with leafy stem, which Mr. A. Bennett informs us is frequent in N. Wales, attracted our attention in several spots about Roundstone. L. Cregduff and other of the numerous loughs about, would amply repay fuller investigation; we observed in L. Cregduff *Potamogeton heterophyllus* Schreb., *P. pusillus* L., a curious form with remarkably blunt stipules, *Nitella translucens* Ag., and *Chara fragilis* var. *capillacea* Thuill. ? The coast is for the most part rocky, but in places, especially at Dog's Bay, sandy, the sand consisting altogether of minute shells. Along it we found *Raphanus maritimus* Sm., *Arabis ciliata* Brown, one plant only, *Polygala oxyptera* Reich., *Viola Curtisii* Forster, *Radiola Millegrana* Sm. We searched on Urrisbeg and about its base for the variety *acutum* of *Asplenium Adiantum-nigrum*, but cannot be sure of having obtained the true form, which seems scarce in that locality. *Matricaria salina* Bab., *Senecio Jacobæa* L. var. *floseulosus* Jord., and *Salix incubacea* L., and one or two other forms of *S. repens* L. and *Agrimonia odorata* Miller. Leaving Roundstone we stopped a night at Maam. Below the hotel, in the river, just above the bridge, is a bed of *Potamogeton sparganiifolius* Læst. We were far too early to gather it in fruit,

but obtained a few pieces in very young bud. Contiguous to the *Potamogeton* was a curious depauperate form of *Juncus supinus* Mœnch., which Mr. A. Bennett considers is not identical with *J. fluitans* Lam. At Cong *Nitella flexilis* Ag. occurred, *Gentiana Amarella* and strong-growing forms of *Potamogeton pusillus* and *P. crispus*, of which only foliage was obtained. Near Headford, Co. Mayo, we met with *Inula Helenium* L. and *Papaver somniferum*, but probably both introduced.

Our next stopping-place was Sligo, where we devoted one day to the investigation of Ben Bulben. Though this mountain is of so low an altitude (1700 ft.), its fine north-eastern face presenting a line of precipitous rocks ranging between the levels of 1100 and 1600 ft., makes it exceedingly interesting from the botanical point of view. We skirted these rocks and found *Polygala grandiflora* Bab. very plentiful, *Dryas octopetala* L. in no great quantity, apparently the ordinary form, a form of *Salix phylicifolia* "Linn." not in fruit; *Galium sylvestre* Poll., *Kaleria cristata* Pers., apparently the ordinary form; *Draba incana* L., *Hieracium anglicum* Fries, *Sesleria cærulea* Scop., *Leontodon pratensis* Koch, *Thalictrum minus* L. var. *montanum*; and higher up, on steep grassy slopes, *Saxifraga hypnoides* L. and with it a form with the leaves of the barren stem much more divided, which Mr. A. Bennett considers to be *sponhemica* Gmel. *Arenaria ciliata* L. does not occur in Ben Bulben, but on King's Mountain, a separate peak of the group. In the outskirts of Sligo, on cultivated land, occurred *Mentha arvensis* L. var. *præcox*. On our way back we stayed one day at Navan, and visited the Boyne. Between the first and second mill *Potamogeton Lonchitis* Tuck., in foliage, was plentiful; beyond the second mill it was flowering and fruiting freely. In the canal by the side of the river was growing *Potamogeton decipiens* Nolte, in good fruit.

Appended is a list of plants observed by us, which are not recorded in the 'Cybele Hibernica':—

Caltha minor. Kerry.
Raphanus maritimus Sm. Roundstone, Galway W.
Elatine hexandra DC. Killarney, Kerry.
Polygala oxyptera Reich. Roundstone, Galway W.
Radiola Millegrana Sm. Roundstone, Galway W.
Leontodon pratensis Koch. Ben Bulben, Sligo.
Salix incubacea L. Roundstone, Galway W. — *S. Smithiana* Galway W.
Potamogeton mucronatus Schrad. Roundstone, Galway W.
Alisma repens Davies. Killarney, Kerry.
Juncus obtusiflorus Ehrh. Galway E. and W.
Scirpus uniglumis Link. Oughterard, Galway W.
Aira alpina L. Kerry.
Equisetum fluviatile L. Killarney, Galway W.
Nitella flexilis Ag. Killarney, Kerry; and Mayo. — *N. opaca* Ag. Killarney, Kerry.—*N. translucens* Ag. Killarney, Kerry; and Roundstone, Galway.
Chara contraria Kuetz. L. Dearg, Galway E. — *C. hispida* L. L. Dearg, Galway E.—*C. polyacantha* A.Br. L. Dearg, Galway E.

SHORT NOTES.

Chara fragilis var. delicatula.—In Journ. Bot., 1884, p. 1, it is stated that there is no record of *Chara* from several counties, including Brecon. In the latter end of August, 1885, I found a considerable quantity of the above-named variety in a mountain pool near the base of the highest peaks known as the Brecknock Beacons. This occurs at a considerable elevation, and the pool in question would occupy an area approximately about half an acre in extent. The only other vegetable occupants of the pool, as far as could be seen from the margin, were *Potamogeton natans* and *Littorella lacustris*. The former floated conspicuously on the surface, while the *Littorella*, together with the *Chara*, clothed the shallow bed of the pool on one side with a beautiful green carpet. The *Chara* grew in tufts of the brightest green, not exceeding three or four inches in height.—John Fraser.

Pembrokeshire Plants and the Rev. Mr. Holcombe.—I find amongst the letters addressed to Sir John Cullum, of Hardwick House, near Bury St. Edmunds, one from the Rev. Mr. Holcombe, of Pembroke, and dated June 6, 1775. It is to be found in 'Letters,' vol. i., No. cxxviii., now preserved at Hardwick House. He was introduced to Sir J. Cullum by Mr. Lightfoot, the author of the 'Flora Scotica'; and, judging from other letters from him, he must have taken much intelligent interest in Botany. But I cannot find his name mentioned in any of the books to which I have access. Sir J. Cullum seems to have had the credit of his discoveries to which he was directed by the letter before me. Mr. Holcombe gave a sketch of a tour to Sir J. Cullum, in which he mentions several plants of interest. He gives the locality of *Brassica oleracea* "on the north side of Tenby." Of *Lavatera arborea* he says, "on the White Sands, the south side of the town, on the top of a projecting cliff under the gardens, is found the *Lavatera arborea*, and that is almost the only accessible place it grows in, though frequent enough on the tops of steep rocks." He also says "On a high rock projecting from the Penally Borroughs is found *Convallaria Polygonatum*"; and it existed there recently. But the most interesting note is that of the locality of *Cyperus longus*, which rests on the authority of Sir J. Cullam and Sir Joseph Banks, as growing near St. Davids. Mr. Holcombe directs Sir J. Cullum to it as follows, and he seems to have found it at the spot indicated. Mr. Holcombe says it grows on the road from St. David's to St. David's Head, "in a little gully about a quarter of a mile above the bay called Whitsand Bay.*" There is a brook at this point, by which it doubtless grew; and Sir J. Bullum mentions the "little rivulet" as its locality in the 'Botanists' Guide' (ii. 503). I believe that agricultural improvements have been made there, and thus this interesting plant was

---

[* See Journ. Bot. 1884, 44, for a fuller description of the locality, taken from the specimen in Herb. Banks.—Ed. Journ. Bot.]

destroyed. I did not find it, nor have any recent visitors to the spot, as far as I am informed. It is quite clear that the plant once grew there, and it will probably be found in some similar locality in S. Wales. Mr. Holcombe seems to have been the Pembrokeshire botanist of the middle of the last century, and to have shown Sir Joseph Banks and others many of the plants recorded under their names. For instance, he claims to have "had the honour of discovering *Sison verticillatum* [our *Carum verticillatum*] first to be an English plant," and informed Sir Joseph Banks of it through Mr. Lightfoot, by whom it was mentioned to Hudson, who inserted it in the 'Flora Anglica' (Ed. 2, p. 120), on the authority of Sir J. Banks. No one says anything about Mr. Holcombe, and so I hope that this note may be worthy of publication, to add his name to the accurate students of British Botany, who have never themselves published the results of their studies.—C. C. Babington.

Helleborus fœtidus in Glamorganshire.—Except in the south and east of England, this plant is generally considered as an escape from cultivation. It is recorded from Glamorgan in Top. Bot., with doubt as to its nativity. I found it in August last, at the upper end of Three Cliffs Bay, Gower, where the bay narrows into a valley traversed by a stream, wooded on one side and covered with great masses of gorse bushes on the other; here it grows in great abundance, with every appearance of being wild. Near the base of the steep sloping bank, amongst the gorse bushes, plants of all sizes were scattered about. The green turf, the large gorse bushes, and the appearance of the plants themselves, all bespoke a long period in which the soil had been undisturbed by the spade, and the nature of the ground and its surroundings precludes the idea of any other mode of cultivation there.—John Fraser.

Caithness Botany (see Journ. Bot. 1885, 333). — I was exceedingly pleased to see the record of work done in Sutherland and Caithness by Rev. H. Fox and Mr. F. J. Hanbury. I am very well acquainted with the latter county, and when I botanized part of it in 1883, I added some new records, a few of which have escaped observation. Before speaking of these I may observe that of those recorded as new to Caithness, four only, *Reseda Luteola*, *Leontodon hispidus*, *Orchis incarnata*, and *Scirpus uniglumis*, can claim that honour,* all the others having been previously discovered by myself and other local botanists; some, such as *Pyrus Aucuparia*, *Rhinanthus Crista-galli*, and *Salix cinerea*, are so common that their omission from the 'Cybele' must have been accidental. Caithness is almost entirely devoid of trees, and *Ulmus montana* and *Sambucus nigra*, as well as *Pyrus Aria* and a few others, are very doubtful natives. From examination of the little natural wood now remaining, I was then led to conclude that *Populus tremula*, *Pyrus aucuparia*, *Betula alba* and *Corylus Avellana*,

---

* [Our correspondent does not, we think, notice that Messrs. Fox and Hanbury only stated that the plants are "not recorded in second edition of 'Topographical Botany.'"—Ed. Journ. Bot.]

are the only indigenous trees. In the neighbourhood of Loch Winless I found *Anagallis tenella* and *Schœnus nigricans*, both rare in the county; and pursuing the moorland burn towards its source, I found the following, *Carex Œderi*, *Scirpus pauciflora*, *Drosera intermedia* and *Carex fulva*, all new records so far as I am aware. On the banks of the Thurso River *Juncus glaucus* is sparsely scattered, along with many Hieracia of a doubtful character, but chiefly intermediate between *H. crocatum* and *H. boreale*, possibly nearer the former. Though affording numerous rarities for the plant-hunter, Caithness contains a comparatively small number of species, probably not more than 450, including varieties, so that Mr. Fox and his companion may, under these circumstances, feel gratified in having added so many.—Anstruther Davidson.

Plants of N. Wilts and E. Gloster.—To the list which appears in the Journ. Bot., 1885, pp. 274–5, may be added:—

Ranunculus floribundus Bab. In the upper reaches of the Thames, abundantly; Gloster and Wilts.

Rosa tomentosa Sm. Near Lechlade; Gloster E.

Rubus rudis W. Oddington; Gloster E.—*R. leucostachys* Sm. Oddington; Gloster E.—*R. amplificatus* W. & N. Oddington; Gloster E.

Callitriche platycarpa K. Lechlade; Gloster E.

Orchis latifolia L. Meadow near Marstou Measey; N. Wilts.

Scirpus multicaulis Sm. Near Kelmsford, Gloster E.; and Marston Measey, N. Wilts.

The *Festuca* from Marston and Lechlade has been referred by Prof. Haeckel to *F. ovina* L., var. *duriuscula*, subvar. *brachyphylla* Haeck. I have since found the same form on oolitic ground, and on a wall-top near Banbury.—G. C. Druce.

Narcissus Pseudo-Narcissus in Breconshire.—A daffodil gathered by the Hay Road near Brecon early in April last, by my daughter, has been submitted to Mr. J. G. Baker, who thinks it is typical *Pseudo-narcissus*. This, perhaps, is worth recording for the segregate (see Journ. Bot. 1884, p. 194). Other records, in addition to them in Mr. Barrett's valuable paper on the Flora of Breconshire (Journ. Bot. 1885, p. 39), are *Vinca minor* L., Priory Grove; *Polygonum Bistorta* L., Priory Grove; and an "alien" from the same locality, *Coriandrum sativum* L. A violet from the Hay Road is, I think, *Viola Reichenbachiana*. The specimen is a poor one, and hardly worth submitting to an expert, but it would be well for some resident botanist to search this locality carefully next spring.—Alfred Fryer.

Pilularia globulifera in Westmoreland.—In glancing over Mr. Baker's 'Flora of the Lake District,' I noticed that this plant was not recorded for Westmoreland. I found it on Brant Fell, while collecting Desmids the 3rd of last August. *Sparganium minimum*, *Alisma ranunculoides*, *Hypericum Elodes*, *Utricularia vulgaris*, *U. minor*, *Rhynchospora alba*, *Carex vesicaria*, *Menyanthes trifoliata*, *Narthecium Ossifragum*, *Nymphæa alba*, and *Anagallis tenella* were amongst the other plants in the neighbouring watery places.

Selaginella selaginoides occurred at Lindeth, which is the lowest altitude I have ever seen it at; it occurs much more frequently a thousand feet higher. *Primula farinosa* is abundant about the rills on the east side of the great hollow of Fairfield, and higher up on the same hill *Cochlearia alpina* grows with *Saxifraga aizoides*; and still higher, at considerably over 2000 ft., I gathered *Luzula sylvatica* in a barren state, while *L. spicata* was brought to me from a higher point that I did not attain. *Saxifraga stellaris* is quite a feature about the sources of rills, where it nestles in beds of *Philonotis fontana*, *Dicranella squarrosa* and *Sarcoscyphus Ehrharti*. *Caltha minor* was sparingly seen at the head of Rosset Ghyll. *Sedum anglicum*, *Sanguisorba officinalis*, *Stachys Betonica*, *Hypericum pulchrum*, *Festuca pratensis*, *Jasione montana* and *Phalaris canariensis* were seen between Bowness and Lindeth, the first five in great abundance, the last one on a bank, holding its own with native grasses far away from any house. *Isoetes lacustris* is abundant in Angle Tarn, under Bow Fell. White *Orchis mascula* occurred in profusion in a field near Dungeon Ghyll.—W. West.

Variety of Nymphæa alba.—Mr. Frank Miles, in the 'Garden' of Dec. 26 last, p. 653, writes:—"*Nymphæa alba* var. Loth Ame. I owe this to the kindness of Lady Wemyss, but nowhere can I find any acccount of it. It is a small-flowered variety with an inclination to be pink, showing on its outer petals the purple spots of [var.] *rubra*. Mr. Laxton has observed one similar in the Ouse near Bedford."

EUROPEAN PRIMULAS.

In order to assist in the arrangement of European Primulas at the Exhibition to be held by the Royal Horticultural Society in 1886, Mr. J. G. Baker, F.R.S., has drawn up the following provisional list, classified in three groups, *viz.*:—

1. Well-marked species distinguished from one another by broad clear characters.

2. Subspecies or varieties distinguished from the types under which they are placed by slight characters.

3. Probable hybrid types which have received names as if they were species.

Synonyms are printed in italics.

Section 1.—Primulastra. Young leaves revolute, not mealy beneath, Calyx strongly ribbed.

1. vulgaris Huds., *grandiflora* Lam., *acaulis* Jacq.; Sibthorpii Reich., *amæna* Hort.

2. elatior Jacq.; Pallasii *Lehm.*; Perreiniana *Flugge*; carpathica *Fuss*.

3. officinalis Scop., *veris* Linn; macrocalyx *Bunge*; suaveolens *Bert.*; Columnæ *Ten.*; *Tommasini* G. & G.

Section 2.—Aleuritia. Young leaves revolute, mealy beneath. Flowers small, with a long corolla-tube.

4. farinosa Linn.; scotica *Hook.*; Warei *Stein.*; stricta *Hornem.*; frondosa *Janka.*

5. longiflora All.

6. sibirica Jacq.; *finmarchica* Jacq.; *norvegica*, Retz.

Section 3.—Auriculastra. Young leaves involute. Calyx short.

7. Auricula Linn.; Balbisii *Lehm.*; ciliata *Moretti*; dolomitica *Hort.*; Obristii *Stein.*; similis *Stein.*

8. Palinuri Petag.

9. carniolica Jacq.; *integrifolia* Scop.; multiceps *Frey.*; Freyeri *Hoppe.*

10. marginata Curt.; *crenata* Lam.

11. viscosa Vill.; pedemontana *Thom.*; commutata *Schott*; latifolia *Lap.*; graveolens *Heyet.*; ciliata *Schrank*; confinis *Schott* villosa *Wulf.*; hirsuta *All.*; Berninæ *Kern.*

12. daonensis Leyb.; oenensis *Thom.*; Stelviana *Vulp.*; cadinensis *Hort.*

Section 4.—Arthritica. Young leaves involute. Calyx long.

13. caycina Duby., *glaucescens* Morett.

14. spectabilis Tratt., *Polliniana* Morett.; Kitaibeliana *Schott.*

15. wulfeniana Schott; longibarda, *Hort*,

16. Clusiana Tausch.; Churchillii *Hort.*

17. integrifolia Linn.; Candolleana *Reich.*

18. Allioni Lois.

19. tyrolensis Schott.

20. minima Linn.; serratifolia *Gusm.*; Sauteri *Schott.*

21. glutinosa Wulf.

Hybrids of section *Primulastra*,—brevistyla, *DC.*, *variabilis Goup.*, 1–3; digenea *Kerner*, 1–2; flagellicaulis *Kerner*, 1–3; media *Peterm.*, *unicolor Lange*, 2–3; Tenoriana *Kern*, 1–3.

Hybrids of sections *Auriculastra* and *Arthritica.*—biflora *Huter*, 20–21; alpina *Schleich.*; rhoetica *Koch*, 7–11; Arctotis *Kerner*, 7–11; Dinyana *Lagger*, 17–11; discolor *Leyb.*, 7–12; Dumoulini *Stein*, 20–14; Facchini *Schott*, 20–14; Floerkeana *Schrad.*, 21–20; Forsteri *Stein*, 20–11; Gebelii *Kern.*, 7–11; Huteri *Kern.*, 20–21; intermedia *Portenschlag*, 20–16; Kerneri *Gobel & Stein*, 7–11; Muretiana *Moritz*, 17–11; obovata *Huter*, 7–18; Peyritschii *Stein*, 7–11; Portae *Huter*, 7–12; pubescens *Jacq.*, rhætica *Gaud.*, helvetica *Don*, 7–11; pumila *Kern.*, 20–12; salisburgensis *Flörke*, 21–20; Steinii *Obrist*, 20–11; Sturii *Schott*, 20–11; venusta *Host*, 7–9; Venzoi *Huter*, 19–15; Weldeniana *Reich.*, 7–14.

NOTICES OF BOOKS.

Indigenous Flowers of the Hawaiian Islands. Forty-four plates painted in water-colours and described by Mrs. Francis Sinclair, Jun. London: Sampson Low. 31s. 6d.

This handsome quarto is devoted to representations—which if not strictly botanical are evidently careful and accurate—of some of the more striking plants of the Hawaiian Flora, collected on the islands of Kauai and Niihau, the most northern of the Hawaiian Archipelago. Mrs. Sinclair does not profess to be a botanist, but she is evidently an observer, as is shown not only by her drawings, but by the simple descriptions which accompany them. Her notes and pictures are the more valuable because the native vegetation is fast disappearing. "Forest fires, animals and agriculture have so changed the islands within the last fifty or sixty years, that one can now travel for miles in some districts without finding a single indigenous plant, the ground being wholly taken possession of by weeds, shrubs and grasses imported from various countries. It is remarkable that plants from both tropical and temperate regions seem to thrive equally well in these islands, many of them spreading as if by magic, and rapidly exterminating much of the native flora." Mrs. Sinclair writes thus in her modest preface, and the letter-press to many of the plates tells the same tale. Unfortunately, as is the case elsewhere, it is the purely endemic species which are most in danger of extinction. The notes contain some interesting scraps of folk-lore: thus of *Lysimachia Hillebrandii* we are told, that "if the plant is pulled, 'the tears of heaven' [rain] will fall. So in the old days the natives were careful not to gather it, as they dreaded the cold mountain rain, which was very inconvenient during their expeditions." This corresponds closely with the Cumberland superstition which has gained for our *Veronica Chamædrys* the name of "Thunner Flower."

Manual of the Botany (Phanerogamia and Pteridophyta) of the Rocky Mountain Region, from New Mexico to the British Boundary. By John M. Coulter, Ph.D. New York and Chicago: Ivison & Co. 1885. 8vo, pp. xvi., 453, 28; 1 dol. 85 cents.

A handbook of this kind is always a welcome addition to the library of the student, as well as to that of the field-botanist. Dr. Coulter has produced a volume which not only in print and binding (both excellent), but in the more important qualifications of compactness and completeness, claims a place by the side of Asa Gray's 'Manual of the Northern United States.' And we on this side of the Atlantic welcome a book which, in so handy a form, brings together the numerous species and several genera which have been described of recent years in various American publications which are necessarily inaccessible to most private workers, and tedious to consult.

Dr. Coulter, whose name will be familiar to our readers in connection with his 'Botanical Gazette,' was associated with Prof.

Porter in the 'Synopsis of the Flora of Colorado' (1874). "The demand even then for a book by no means complete or conveniently arranged was unexpected, and in the wonderful development of the decade since then lies the confidence that a more convenient book, covering a greater range, will be welcome to many." This confidence will certainly not prove to have been misplaced.

By the "Rocky Mountain Region," as here used, the author refers to the tract beginning with the western limit of the mountain system, and extending eastward across the plains to the prairies, and including Colorado, Wyoming, Montana, Western Dakota, Western Nebraska and Western Kansas. The larger part of the contiguous floras are also described, embracing the western part of the Indian Territory, North-western Texas, Northern New Mexico and Arizona, and Eastern Utah and Idaho. The order of the 'Genera Plantarum' is followed in the main, but gymnosperms have been placed at the end of phænogams and monocotyledons and dicotyledons subordinated to angiosperms. Dr. Asa Gray and Prof. Sereno Watson have, as might have been expected of them, been helpful in the work; the genus *Salix* has been undertaken by Mr. M. S. Bebb, and Mr. L. N. Bailey has elaborated the species of *Carex*.

A detailed review of what is primarily a book for workers, whether at home or in the field, and consists entirely of descriptions of species, is hardly necessary. It is sufficient, having indicated its scope, to say that, to use a hackneyed but in this case strictly accurate phrase, "this Manual supplies a want which has long been felt," and will find a place on the shelves of not a few Old World botanists.

Fruits and Fruit-trees, Home and Foreign; an Index to the kinds valued in Britain. By Leo. H. Grindon. Manchester: Palmer & Horne. 8vo, pp. xii. 320. **Price 6s.**

Mr. Grindon, without taking a distinctly scientific ground, or indulging in the speculative style of writing which is fashionable just now, has done much by his books to spread the knowledge of Botany, and make the subject attractive to the general reader. He does not sacrifice accuracy to popularity, as is too often the case with "popular" writers, but in a small space gives the results of a wide range of reading, conveyed in a pleasant and intelligible manner. The volume before us is his most recent work, and "claims to be no more than an amateur's contribution to the literature of the very large and varied subject of Fruits and Fruiting-plants," the last word being used in a popular rather than a botanical sense. It is the work of a man who is an admiring and intelligent observer of Nature, and whose memory is happily retentive of small points tending to illustrate the subject of which he is treating. 'Fruits and Fruit-trees' would form an excellent prize-book for schools, and a useful addition to parish libraries; the type and paper are excellent.

Botaniker-Kalendar, 1886. Herausgegeben von P. Sydow und C. Mylius. In zwei Theilen. i. Theil. Kalendarium, Schreib- und Notiz-Kalender, Hilfsmittel für die botanische Praxis, &c. [pp. xii., 96]. ii. Theil. Botanisches Jahrbuch. Pp. 112. Berlin: Springer, "1886."

These very charming little volumes will be invaluable to the German field-botanist as well as to the student. At a very low price—the two volumes may be bought in London for 3s. 6d.—a most useful and compact book of reference has been provided, containing so much practical and varied information that it is safe to prophesy for it a large sale. The first volume begins with a calendar, thoughtfully arranged to show "protestantische, katolische und jüdische Festtage;" then follows a diary, one week on each page, the opposite page being left blank for additional notes, the birthdays and deathdays of notable botanists being noted. Some practical directions for plant-collecting and amateur other matters are followed by a comprehensive list of German floras. Later on we have an elaborate descriptive key to the German Rubi, based on Focke's 'Synopsis,' by Dr. Utsch. in which we notice a new name—"*R. Beckhausi* U. = *R. caesius* × *serpens*." Dr. Christ gives an analytical key of the German roses, Dr. Sydow treats the Characeæ in similar fashion, and Dr. Warnstorf the Sphagnæ. Other useful items conclude the volume, which is bound in limp cloth, in pocket-book form. The second part, which is intended for use at home, begins with biographies of some lately deceased botanists—A. H. A. J. Münter (1815–1885), J. C. Döll (1808–1805), and J. A. C. Röper (1801–1885); then come long lists of German local botanists and specialists and of natural history societies. Later on we have lists of the course of lectures given at the various German Universities and High-schools, the volume concluding with a very full bibliography of German botanical publications issued from July, 1884, to June 30, 1885, and an excellent index of authors. Both type and paper throughout are excellent. Are our British botanists sufficiently numerous and energetic to support a work less ambitious, but on similar lines? That such a year-book would be of great use there can be no doubt, even if it went no further than a list of local botanists and a bibliographical section. We commend the notion to our readers, promising our hearty support to any one who will take up the project.

The Plants of the Bible. By John Hutton Balfour, M.A., &c. New and enlarged edition. London: Nelson. 1885. 8vo, pp. 249. 6s.

Bible Flowers and Flower-lore. [Anonymous]. London: Hodder and Stoughton. 8vo, pp. viii., 151. 1s. 6d.

It is not to be wondered at that the plants of the Bible have presented themselves as attractive subjects of study; and that their literature should be both varied and extensive, dating from the quaint Latin volume of Lemnius, published in 1563. But it at

first sight seems strange that there should be no work on the subject which can be considered thoroughly satisfactory. Of course this is in a a great measure due to the uncertainty in very many cases as to what plants were intended by the inspired writers. The most various views have been taken on this head; and indeed, when we get beyond a few about which there can be no mistake, we are brought face to face with a number of doubts and opinions and conjectures, from which our only way of escape is in the reflection that after all it does not very much matter.

Neither of the volumes before us is likely to be accepted as offering any material help in our researches on the subject. The second, which is the less pretentious, is the better of the two: it has not the air of bookmaking about it which characterises Dr. Balfour's work, and we think it far better that figures should be (as in 'Bible Flowers') entirely absent, than that such absurdities as the "Egyptian Lotus" (p. 184), and "Star of Bethlehem" (p. 238) of 'The Plants of the Bible' should be presented to the public. Unless illustrations really *illustrate*, they are worse than useless in books of this kind; they add to the size and expense, and have no advantages to oppose to these drawbacks.

As we are told that the whole of the work has been read in proof by Dr. Balfour before his death, we may be allowed to express regret that his preface should be a mere reprint of that prefixed to the original edition issued in 1857. This is now manifestly out of date; and we should certainly have had some allusion to those who have by travel and research added of late years to our knowledge of the Holy Land. Something in the way of a sketch of the botany of Palestine in its present-day aspect might also well have been given.

We regret we cannot speak more favourably of what might have been a good book. But its scientific value is of the slightest, while its given reflections are terribly commonplace. Worse than all, there is no index; a defect which is shared by 'Bible Flowers.' This latter is a pleasantly-written little book in a pretty cover, and would make a suitable Sunday-school prize.

The recently issued (Dec.) part of the 'Icones Plantarum' contains descriptions and figures of some of Mr. Thomson's Kilimanjaro plants and of other novelties, among them a new genus (*Psyllothamnus* Oliv.) of *Illecebracea*, sent "with a parcel of specimens from Aden and thereabouts," by Dr. Hugh Beevor. Specimens were sent to the British Museum by Major Yerbury last year, collected on the 1st of March, and definitely localised, "Summit of Shum-shum, common."

New Books.—Isabella Sinclair, 'Indigenous Flowers of the Hawaiian Islands' (44 plates 4to, and descriptions: London, Sampson Low: £1 11*s.* 6*d.* — Joseph Hervier, 'Recherches sur la Flore de la Loire': Paris, Savy: (fasc. i. 8vo, pp. viii. 60, tt. 2). — Henri Baillon, 'Histoire des Plantes': Paris, Hachette, "1886" (vol. viii.; *Compositæ, Campanulaceæ, Cucurbitaceæ, Loasaceæ,*

Passifloreæ, Begoniaceæ: 8vo, pp. 515, figg. 353). — C. PANTEL, 'Formation des Cevennes avec la liste des plantes qui croissent dans ce pays' (Paris, Aniéré: 8vo, p. 79). — G. B. DE TONI & D. LEVI, 'Flora Algologica della Venezia. i. Floridee' (Venice, Antonelli: 8vo. pp. 182). — A. GREMLI (Transl. by J. J. VETTER), 'Flore Analytique de la Suisse' (Bale, Georg, "1886": 8vo, pp. vi. 588). — F. W. TOUSSAINT, 'Die Wiese' (Breslau, Korn: 8vo, pp. [xii.], 276: 12 plates).—G. HIERONYMUS, 'Icones et descriptiones Plantarum quæ sponte in Republica Argentina crescunt' (Breslau, 1st part: 4to, pp. 59, tt. x.). — W. BARBEY, 'Floræ Sardoæ Compendium' (Bale, Georg: 4to, pp. 265: 7 plates and portrait of Moris). — E. TROUESSART, 'Les Microbes, les Ferments, et les Moisissures' (Paris, Alcan: 8vo, pp. iv., 304, 107 cuts: 6 *fr.*) — H. ZIPPEL, 'Ausländische Handels-und Näturpflanzen' (Braunschweig, Biewig: 8vo, pp. x. 214, tt. 60). — J. EISENBERG, 'Bakteriologische Diagnostik') Hamburg, Voss: 4to, pp. xii., 30 tables).—E. ROTH, 'Additamenta ad Conspectum Floræ Europææ' (Berlin, Weidling: 8vo, pp. 46).—'Flore Pittoresque de la France' (Paris, Rothschild: 4to, pp. xvi. 473, tt. 80, 989 cuts: 35 *fr.*.. — C. ROCHON & E. ROZE, 'Atlas des Champignons' (Paris, Doin; fol. fasc. i. pp. viii. 24, tt. 8; 10 *fr.*). — J. M. COULTER, 'Manual of the Botany of the Rocky Mountain Region' (New York, Ivison and Co.: 8vo, pp. xvi. 453, 28: 1 *dol.* 85 *cents.*) — J. H. BALFOUR, 'The Plants of the Bible' (London, Nelson: 8vo, pp. 249: illustrated with cuts. 6*s.*). — S. LUND & HJALMAR KJÆRSKON, 'Morfologisk-anatomisk Beskrivelse af Brassica oleracea, B. campestris & B. Napus' (Copenhagen, Hagerup: 8vo, pp. 151, tt. 16). — H. WALDNER, 'Ueber Europæische Rosentypen' (Worms, Bœninger: 4to, pp. 56, 1 tab.) — G. L. GOODALE, 'Physiological Botany' (Gray's Botanical Text-book, pt. 2) (New York, Ivison: 8vo, pp. xxi. 499, 36).

ARTICLES IN JOURNALS.

Ann. Sciences Nat. (Bot. Ser. vii., ii. nos. 2 and 3) (Nov.). — E. Bescherelle, 'Florule biologique de Mayotte.' — C. Timiriazeff, 'Etat actuel de nos connaisances sur la fonction chlorophyllienne.' — M. L. du Sablon, 'Recherches sur le développement du sporogone des Hepatiques' (1 plate). — 'L. Guignard, 'Observations sur les Santalacées' (1 plate).—J. Herail, 'Recherches sur l'anatomie comparée de la tige des Dicotylédones.'

Bot. Centralblatt (Nos. 48, 49).—A. Mahlert, 'Zur Kentniss der Anatomie der Laubblätter der Coniferen' (Nos. 50–52). — A. Hansgirg, 'Noch einmal über die Phykochromaceen-Schwärmer.'

Bot. Zeitung (Nov. 20 — Dec. 4).— A. F. W. Schimper, 'Ueber Bildung und Wanderung der Kohlehydrate in den Laubblättern' (Dec. 11). — W. Belajeff, 'Antheridien und Spermatozoiden der heterosporen Lycopodiaceen' (1 tab.),

Flora (Nov. 21) .— Röll, 'Zur Systematik der Torfmoose.'— (Dec. 1). W. Nylander, 'Lichenes novi e Freto Behringii.' — Id., 'Parmeliæ exoticæ novæ.'—(Dec. 11). L. Celakovsky, 'Ueber die

Inflorescenz von *Typha*.' — (Dec. 21). P. G. Strobl, 'Flora der Nebroden' (cont.).

Gardeners' Chronicle (Dec. 5). — *Erica Rimanni* Rchb. f. sp. n. *Eucharis Mastersii* (fig. 163). — *Cladostrichum passifloræ* Pim sp. n. (fig. 164).—Fruit of *Lycaste cruenta* (fig. 165).—(Dec. 13). *Styrax japonicum* (fig. 166).—W. B. Hemsley, 'Giant Bromeliads of Chili.' —W. G. Smith, '*Mucor stolonifer* and *M. Mucedo*' (figs. 170–172). —(Dec. 19). *Schismatoglottis neoguineensis* N. E. Br., sp. n.—J. G. Baker, 'Synopsis of *Nerine*.' — G. B. Wollaston, 'Apospory in Ferns' (figs. 174–182). — *Pinus tuberculata* (figs. 183, 184).—G. S. Jenman, 'Proliferation in Ferns.' — (Dec. 26). J. R. Jackson, 'Cocoa-nut Fibre.'—Fruit of *Stephanotis* (fig. 188).

Grevillea (Dec.). — M. C. Cooke, 'British Fungi.' — Id., 'Fungi of Malay Peninsula.'—Id.. 'Valsa Vitis.'—Id., 'Synopsis Pyrenomycetum.' — Id., 'New British Freshwater Algæ.' —' British Sphæropsideæ.'

Journ. Linn. Soc. xxii. 141 (Dec. 24).— J. Ball, 'Contributions to Flora of Peruvian Andes' (*Ranunculus chiclensis, Drymaria nitida, Trifolium chiclense, Astragalus casapultensis, Cotyledon incanum, C. chiclensis, Sedum andinum, Œnothera psychrophila, Valeriana remota, Senecio casapultensis, Hieracium chiclense, Lugonia andina. Eritrichium Mandonii, Coligonia biumbellata, Chætotropis andina, Deschampsia Mathewsii, Festuca casapultensis, Bromus frigidus*, spp. nn.). —H. Bolus (with notes by N. E. Brown, 'Contributions to South African Botany' (Orchideæ: *Satyrium ochroleucum, S. emarcidum, S. debile, Disa tenuicornis, D. æmula, D. Scullyi, D. pygmæa, D. reticulata, D. lineata, D. Bodkini, Disperis oxyglossa, D. Macowani, D. Woodii, D. Tysoni*, spp. nn.: 1 plate). — G. Henslow, 'A Contribution to the Study of the relative effects of different parts of the Solar Spectrum on the Transpiration of Plants.'

Magyar Növénytani Lapok (Nov. 1). — F. Porcius, 'Additamenta et corrigenda ad enum. pl. phanerogamicarum districtus quondam Naszódiensis.'

Œsterr. Bot. Zeitschrift (Dec.). — L. Celakovsky, '*Alisma arcuatum*' (concl.). — K. Richter, '*Viola spectabilis*,' sp. n. — W. Voss, 'Zur Kenntniss der Rostpilze' (*Puccinia carniolica*, sp. n.). — E. Formánek, 'Flora des bötanisch-mahrischen und des Glatzer Schneegebirges' (cont.). — A. Heider, 'Vegetations verhältnisse Pamphyliens.'—P. G. Strobl, 'Flora des Etna' (cont.).

Revue Botanique (Dec.). —R. du Buysson, 'Etude du genre Amblystegium' (*A. Cashii*, sp. n., from Southport, Lancashire). — H. Olivier, 'Sur les Cladonia de la Flore Francaise.'

Trans. Bot. Soc. Edinburgh (xv. pt. 2). — R. Spruce, 'Conspectus Hepaticorum subordinum, tribuum et subtribuum' (22 plates.

We understand that the Assistant Directorship of the Royal Gardens, Kew, has been finally offered to Mr. D. Morris, Director of Public Gardens and Plantations, Jamaica.

ON THE JAMAICA FERNS OF SLOANE'S HERBARIUM.

By G. S. Jenman, F.L.S.

(Concluded from p. 17).

Pallæa geraniæfolia Fée.

9. *Hemionitis foliis atrovirentibus*, &c., Cat. p. 15; Hist. p. 73, Herb. p. 46. *Pteris pedata* Linn., *P. concolor* L. & S.—This Sloane says was found growing with the preceding between the town of Savanna and Two-mile Wood. Linnæus quotes this specimen for his name, but he quotes others also, which are true as the plant is understood now. *Pallæa geraniæfolia* is distinguished by its punctiform sori which are confluent however at maturity, free veins, and more incised margin. The true identification of Sloane's plant is the more interesting, as it was only rediscovered a few years ago at the old mines near Hope and Gordon Town, when it was supposed to be new to the West Indies.

Aspidium trifoliatum Swartz.

10. *Hemionitis peregrina foliorum*, &c., Cat. p. 15; Hist. p. 73, tab. 26, fig. 2, Herb. p. 47. *Polypodium trifoliatum* Linn.—The specimen is an entire plant, unfertile, in the small merely trilobed state of growth. In a younger stage the fronds of this species are quite entire and even-margined.

Polypodium lycopodioides Linn.

11. *Phyllitis minor scandens*, &c., Cat. p. 15; Hist. p. 73.—On Truncs of Trees, Mount Diabolo. There is a plant of *Polypodium piloselloides* Linn. on the same sheet.

Trichomanes muscoides Swartz; *T. sphærioides* Kunze; *T. punctatum* Poir.

12. *Phyllitis scandens minima*, &c., Cat. p. 15; Hist. t. 27, fig. 1, Herb. p. 71. —The above three species are mixed on the sheet, but not connected, as the figure makes them appear; the larger fronds (*T. muscoides*) are marked in Robert Brown's hand as distinct, and are identified correctly by Grisebach in his 'Fl. Br. W. Ind. Isles,' p. 657. There are also only two or three fronds of *T. sphærioides*, the bulk of the specimens being *T. punctatum*. The specimens described under *T. reptans* Sm. in the 'Synopsis Filicum' of Hooker & Baker is *T. sphærioides* Kze. I may mention here that, on referring to Swartz's types and his original descriptions, I find that his names *reptans* and *pusillum* have been transposed in books and herbaria, and should therefore be reversed. *T. pusillum* Sw. (and as the author applied it) is distinguished from *T. sphærioides* Kze. by the fronds being linear, or branched only at the top into horn-like projections, the midrib continuous to the apex, or branching into the projections, and pinnatiform serration. These are good characters in a species of this group.

[Nos. 13, 14, 15, and 16, tab. 28, figs. 1, 2, 3, 4, are *Marcgravia umbellata* Linn.; and Nos. 17 and 18, tab. 27, figs. 2 and 3, are an aroid.]

Polypodium aureum Linn.

19. *Polypodium altissimum*, Cat. p. 15; Hist. p. 75, Herb. p. 48 and 49.—Inland mountainous parts of the island.

Acrostichum aureum Linn.

20. *Lonchitis palustris maxima*, Cat. p. 15; Hist. p. 76, Herb. p. 50.—Sloane says "It is used instead [of] Thatch to cover Houses. It is also used to stop Dysenteries, and the violent motions of the Iliac Passion, by boiling the Root and drinking the Decoction. The Decoction of the Root is excellent in Obstructions of the Spleen, Quartans, Scurvey, and Melancholy, especially if *Sarsa* and *China* be added. A Salt made of the leaves by Chimistry is an excellent Remedy against Ulcers, and carious Bones of the Toes and legs, being

very drying. *Bon.*" In this and other cases Sloane records the reputed medicinal virtues of plants, apparently approving them in abstaining from comment.

Polypodium reptans Swartz.

21. *Lonchitis Asplenii facie pinnulis variis*, &c., Cat. p. 16; Hist. p. 76, tabs. 29 and 30, fig. 1, Herb. p. 53.—This was brought home by James Harlow. Sloane well describes the great variation of form in this species, and says that he had "not seen in any Plant so great sporting of Nature."

Nephrolepis exaltata Schott.

22. *Lonchitis altissima, pinnulis utrinque*, &c., Cat. p. 16; Hist. p. 77, tab. 31, Herb. p. 52. *Polypodium exaltatum* Linn.; *Aspidium* Sw.—Also, like the last, brought home by James Harlow.

Polypodium simile Linn.

23. *Lonchitis altissima, pinnulis raris*, &c., Cat. p. 16; Hist. p. 77, tab. 32, Herb. p. 51.—Sloane describes this as about 5 ft. long, having a petiole 1½ ft. long. His specimen is 3 ft. long, with a petiole about 15 in.

Asplenium arboreum Willd.

24. *Lonchitis major*, &c., Cat. p. 16; Hist. p. 78, Herb. p. 55. *Asplenium salicifolium* Linn.; *A. auriculatum* Metten. (non Swartz).—As was often the case, the Linnean name was founded on a distinct and dissimilar species.

Asplenium auritum Swartz.

25. *Lonchitis minor*, &c., Cat. p. 16; Hist. p. 78, tab. 33, fig. 1, Herb. p. 56. *Asplenium marinum* Linn. var. B.—Linnæus quotes the above figure, but fortunately there is no mistaking the plant from which the figure was taken. It is merely a small poorish plant of the exceedingly well-distinguished but exceedingly variable *A. auritum*. *A. marinum* Linn. is based on two other Jamaica plants as well, *A. dentatum* Linn. and *A. cultrifolium* Linn. Linnæus sometimes quoted the same figure or plant for different species.

Asplenium auritum Sw.

26. *Lonchitis major, pinnis angustioribus*, &c., Cat. p. 16; Hist. p. 78, t. 33, fig. 2, Herb. p. 57. *Asplenium erosum* Linn.—Linnæus quotes Sloane's figure as above for his species, and Browne's *Asplenium simplex nigrum*, &c., 'N. Hist. Jamaica,' p. 94. The latter, however, is a different species, for Browne quotes *Thesaurus zeylanicus*, tab. 97, which represents *A. falcatum* Linn., and therefore meant *A. erosum* Mett., a Jamaica plant conspecific with the eastern *A. falcatum* Linn. There is no uncertainty about the Swartzian name, under which Sloane's tab. 33, fig. 2, is quoted; and it should therefore be retained for this species, for which it is well established. At p. 54 of Sloane's plates there are Jamaica specimens of *A. falcatum* Linn. = *A. erosum* Mett.

Pteris longifolia Linn.

27. *Lonchitis major, pinnis longis*, &c., Cat. p. 16; Hist. p. 79, t. 34, Herb. p. 59. *Pteris vittata* Linn.—The Linnean names are founded on the larger and smaller states of this species.

Polypodium incanum Swartz.

28. *Polypodium minus*, &c., Cat. p. 16; Hist. p. 79, Herb. p. 60. *Acrostichum polypodioides* Linn.—On rocks on the side of a mountain near Mr. Ellitson's Plantation, Liguanee.

Polypodium pectinatum Linn. and *P. elasticum* Rich. = (*P. Plumula* H. B. K.).

29. *Lonchitis minor*, &c., Cat. p. 16; Hist. p. 79, Herb. p. 61.—A plant of the former, and four of the latter are together on the herb. sheet.

[30. *Lonchitidi affinis arbor anomala*, &c., Cat. p. 16, Hist. p. 80. Merb. p. 62, is *Xylophylla latifolia* Linn. Sloane remarks under it:—"I think this a properer

place for this Plant, than to be put in another, as Dr. Plukenet would do in his *Mantiss*, p. 81."]

Notholæna trichomanoides R. Br., var. *subnuda* Jenman.

31. *Trichomanes majus pinnis sinuatis subtus niveis*, Cat. p. 17; Hist., p. 80, tab. 35, fig. 1, Herb. p. 72. *Pteris trichomanoides* Linn.—The same locality as No. 28.

Aspidium triangulum Sw.

32. *Trichomanes majus totum album*, &c., Cat. p. 17; Hist. p. 81, tab. 36, figs. 1, 2, Herb. pp. 73 and 74.—To this belong figs. 2, 3, 4 of tab. 36. Fig. 5 is a state of *A.* (*Polystichum*) *viviparum* Fée, not so deeply cut as usual. The lobes, which overlap in the specimen, are most clearly shown in the figure, which Grisebach quotes under *A. mucronatum* Swartz, a species not represented in the collection. Fig. 1, a state with broad flat entire segments, Grisebach assigns to *A. trapezioides* Swartz, with which he includes Fée's *A. uviviparum*.

Adiantum pulverulentum Linn.

33. *Trichomanes majus nigrum*, &c., Cat. p. 17; Hist. p. 81, tab. 35, fig. E, Herb. p. 75. *Adiantum serrulatum* Linn.—Probably it is var. *caudatum* Jenman, but all the fronds are simply pinnate, except one which is shortly bipinnate at the very base. It is fully fertile. This is the specimen figured. On the same sheet are three similarly undeveloped fronds of *A. striatum* Swartz. "Rocks on the Banks of Rio d'Oro, and other the rocky inland woody parts of the Island."

Adiantum macrophyllum Swartz and *A. Kaulfussii* Kze.

34. *Trichomanes majus nigrum*, &c., Cat. p. 17, Herb. p. 76.—The two species are mounted together on the same sheet. They were brought home by James Harlow.

Asplenium formosum Willd.

35. *Trichomanes foliolis longioribus eleganter*, &c., Cat. p. 17; Hist. p. 82.—The reference to tab. 36, fig. 2 (a pinna of *Aspidium triangulum* Sw.) is an error. Plukenet, Phyt. tab. 125, fig. 1, is correct. The identity is confirmed by the habitat given, "Fissures of the Rocks, of each side on the Rio d'Oro." This beautiful little species always grows on rocks along the beds of the rivers in Jamaica.

Asplenium dentatum Linn.

36. *Trichomanes, foliolis dentatis, superiore latere auriculatis*, Cat. p. 17; Hist. p. 82, Herb. p. 78.—"On the Fissures of the moister Rocks near the Banks of Rio d'Oro."

Acrostichum (*Olfersia*) *cervinum* Swartz.

37. *Filix maxima in pinnis tantum divisa*, &c., Cat. p. 17; Hist. p. 82, tab. 37, Herb. p. 79.—Mount Diabolo. This is quoted by Grisebach, 'Fl. Brit. W. Ind.,' p. 685, for *Asplenium juglandifolium* Lour. Sloane clearly had not seen the fertile fronds.

Asplenium celtidifolium Mett.

38. *Filix major in pinnas tantum divisa oblongas*, &c., Cat. p. 17; Hist. p. 83, Herb. p. 80.—Gathered and brought home by James Harlow. Harlow seems to have reached a higher elevation, judging by this plant, than Sloane.

Acrostichum (*Stenoclæma*) *sorbifolium* Linn.

39. *Filix major scandens*, &c., Cat. p. 17; Hist. p. 83, tab. 38, Herb. pp. 81, 82, 83. — "On Trees on the South side of Mt. Diablo and the other Truncs of large Trees, in the mountainous woody inland parts of this Island. The Juice mix'd with the Oil of *Sergelim* (or *Sesamum*) Ginger, and long Pepper, and anointed on the Head, Cures Cholerick Headach.—*H. M.*"

Acrostichum (*Gymnopteris*) *nicotianæfolium* Swartz.

40. *Filix major scandens*, &c., Cat. p. 18; Hist. p. 84, tab. 39, Herb. p. 84.—Collected and brought home by Harlow.

Meniscium angustifolium Willd.

41. *Filix major*, &c., Cat. p. 18; Hist. p. 84, tab. 40, Herb. p. 86. *Acrostichum marginatum* Linn.—"Banks of the Rio d'Oro near Archer's Bridge between sixteen Mile Walk and St. Mary's in the North side." Cited by Grisebach, 'Fl. B. W. Ind. Ils.' p. 668, for *Pteris grandifolia* L.

Acrostichum (*Olfersa*) *cervinum* Swartz.

42. *Filix minor*, &c., Cat. p. 18; Hist. p. 84, tab. 41, fig. 2, Herb. p. 87.—Simply a young plant with only one or a single pair of lateral pinnæ.

Aspidium trifoliatum Swartz.

43. *Hemionitidi affinis Filix major trifida*, &c., Cat. p. 18; Hist. p. 85, tab. 42, Herb. p. 88. *Polypodium trifoliatum* Linn.—"Banks of the Rio Cobre, by the Orange Walk in the Crescent Plantation." Sloane adds:—"If this be what Piso means, he says 'tis very opening, purging of Choler, cutting and aperitive above the European *Polypodium*."

Danæa nodosa Smith.

43. [number repeated]. *Filix major*, &c., Cat. p. 18; Hist. p. 85, tab. 41, fig. 1, Herb. p. 85. *Asplenium nodosum* Linn.—There are two specimens on the herb. sheet: a small plant with two fronds, which is that figured, and a larger single frond. Both were gathered in a young state, for the species grows several times larger.

Polypodium tetragonum Swartz, var. *P. megalodus* Schbr., and *P. crenatum* Swartz.

44. *Filix major*, &c., Cat. p. 18; Hist. p. 85, Herb. p. 89.—In the Herbarium the number (89) of the page is repeated, and a figure, not included in the series of drawings, and specimens of *P. obliteratum* Swartz are given as belonging to this. Banks of the Rio d'Oro, near Sixteen Mile Walk.

Nephrodium amboinense Presl.

45. *Filix minor*, &c., Cat. p. 18; Hist. p. 86, tab. 43, fig. 1, Herb. p. 91.—There are three fronds on the sheet, two large and a small; the latter and the right-hand larger one are *Polypodium tetragonum* Presl.; the other, from which the figure was taken, is *Aspidium serrulatum* Mett., not separable from the East Indian *Nephrodium amboinense* Presl. Herb. pp. 90 and 92 are the same. Mount Diabolo, near Archer's Ridge.

Nephrodium amboinense Presl.

46. *Filix minor*, &c., Cat. p. 18; Hist. p. 86, tab. 43, fig. 2, Herb. p. 93.—This and the last are likely distinct. They differ in their lower pinnæ, which in this are gradually reduced and not in the other. It is a very variable species. The figure is quoted by Grisebach for his *Aspidium asplenioides* (*Polypodium* Swartz), which, however, is not in the collection.

Aspidium semicordatum Swartz.

47. *Filix minor*, &c., Cat. p. 18; Hist. p. 86, tab. 44, fig. 1, Herb. p. 94.—In the centre of the lower part of the same page of the Herbarium is a small barren frond of *Lomaria procera* Spreng. Sides of Mount Diablo, very plentifully.

Blechnum occidentale Linn.

48. *Filix minor*, &c., Cat. p. 18; Hist. p. 87, tab. 44, fig. 2, Herb. p. 95.—Mount Diablo.

Gymnogramma rufa, Desv.

49. *Filix minor*, &c., Cat. p. 19; Hist. p. 87, tab. 45, fig. 1, Herb. p. 96. *Acrostichum rufum* Linn.—Gathered and brought home by James Harlow.

Aspidium macrophyllum Swartz, var. *pilosum*.

50. *Filix minor*, &c,, Cat. p. 19; Hist. p. 87, Herb. p. 98.—*Cardiochlæna pilosa* Fée.

Gymnogramma trifoliata Desv.

51. *Phyllitis ramosa trifida*, &c., Cat. p. 19; Hist. p. 88, tab. 45, fig. 2, Herb. p. 99.—*Acrostichum trifoliatum* Linn.

Lygodium volubile Swartz.

52. *Phyllitidi multifidæ*, &c., Cat. p. 19; Hist. p. 88, tab. 46, fig. 1, Herb. pp. 101 and 102. *Ophioglossum volubile* Linn.—"Plentifully on Mount Diablo, Archer's Ridge, &c., in Mountain River Plantations."

Lygodium venustum Swartz.

53. *Phyllitidi multifidæ affinis*, &c., Cat. p. 19; Hist. p. 88, Herb. p. 100. *Ophioglossum scandens* Linn.—"In a wood near Capt. Heywood's House, in St. Maries in the North side of the Island." This was not collected again in Jamaica till a few years ago, when it appeared with a few specimens sent me by Mrs. Richmond, wife of the District Engineer, who gathered them in the vicinity of Spanish Town.

Davallia (*Saccoloma*) *Sloanei* Jenman.

54. *Filix non ramosa maxima*, &c., Cat. p. 19; Hist. p. 89, tab. 47, Herb. p. 102. *Pteris Sloanei* Radd.—As Raddi's identification was merely a guess from the figure, and he mistook the genus, I give a description of this plant:—Petioles strong, erect, dark brown, channelled. Fronds ample, 3 ft. long or more, nearly or quite as broad, bipinnatifid or fully bipinnate. Pinnæ alternate, obliquely spreading, 3—5 in. apart from base to base; the upper ones ligulate, subentire, sessile; the lower petiolate, fully pinnate at the base, above this pinnatifid almost to the costa; 10—15 in. long, 3—6 in. wide.; suddenly reduced in the outer third to 1 in. width, ligulate portion, which is broadly and roundly lobed within, the lobes passing outwards through sinuation of the margin into the serrulate acuminate point. Pinnulæ alternate, linear-ligulate, 3—4 in. long, $\frac{1}{3}$—$\frac{1}{2}$ in. wide, oblique, and, except the lower one or two, fully adnate and connected by a decurrent membrane, with a broad sinus, rounded on the upper, minutely notched on the lower, side, $\frac{1}{4}$—$\frac{1}{2}$ in. wide between; basal ones reduced. Margins crenate within the very acuminate serrate point. Texture chartaceous, pellucid. Surfaces naked, bright green. Rachis and costæ bright brown, channelled. Veins once forked, mostly from the base, fascicled in the lobes of the elongated outer parts of the fronds and pinnæ. Sori terminal on all the veins, punctiform, forming an uninterrupted submarginal line. Involucres transversely attached, pocket-like, the crenations of the thin membranous margin forming an outer reflexed valve.—This is a fine and very singular plant, resembling most in cutting *Dicksonia Plumieri* and *D. adiantoides*, with fructification like *Davallia Saccoloma*. Sloane's specimen is an entire frond, which is fertile throughout, even to the characteristic ligulate outer portions. He says:—"This great Fern rises to four Foot high, by a reddish brown stalk as big as ones Finger, having Twigs plac'd alternateively, at two or three Inches distance; about a Foot and a half long. They [the pinnæ] are beset on each side with Pinnæ [pinnulæ] alternateively at more or less distance, each of which is about four Inches long, and not an Inch broad near its beginning where broadest, and whence it decreases, ending in a point, being a little indented on the edges in the broadest part, and everywhere of a Grass-green colour, and having its Seeds lying in a ferruginous Line or Welt along its edges: the tops of the lower Twigs [pinnæ] and the whole ones at the top [of the fronds] are broad and sinuated, or waved after the manner of *Asplenium*. It grows about Mount Diablo in several Places." Resident collectors might again search the Mount Diablo region for this 200 years' old discovery. Doubtless many species have disappeared under the cultivator's clearings; is this one of them? Grisebach referred it to *Pteris crassipes* Ag. ('Fl. Brit. W. Ind., p. 669).

Nephrodium Serra Desv.

55. *Filix non ramosa major*, &c., Cat. p. 19; Hist. p. 89, tab. 48, fig. 1, Herb. pp. 100 and 104. *Aspidium Serra* Sw.—Banks of the Rio Cobre. Sloane's specimens are typical, judged by a Swartzian specimen in the Brit. Mus. Herb.

Neprodium patens Desv.

56. *Filix non ramosa major*, &c., Cat. p. 19; Hist. p. 89, tab. 49, fig. 1, Herb. pp. 106 and 107.—Banks of the Rio d'Oro. Figure quoted by Grisebach for *Aspidium limbatum* Metz., 'Fl. Brit. W. Ind.' p. 692.

Nephrodium Sloanei Baker.

57. *Filix non ramosa major*, &c., Cat. p. 19; Hist. p. 90, tab. 50, fig. 1, Herb. p. 108.—*Aspidium invisum* Swartz. The Swartzian name was preoccupied by Forster's Polynesian plant, which, by the way, is quite identical with the narrow variety of *N. Sloanei* that is generally taken to be *N. Serra*, but which differs from this latter by its broader pinnæ with narrow falcate, instead of broad deltoid, segments. Tab. 51, Herb. p. 110, is this variety, and Sloane describes the variation of this species.

Nephrodium usitatum Jenman.

58. *Filix non ramosa major*, &c., Cat. p. 20; Hist. p. 90, tab. 48, fig. 2, Herb. p. 103. *Polypodium unitum* Linn.; *P. tetragonum*, var. *a*, Gr., 'Fl. Brit. W. Ind.' p. 697. The Linnean name belongs possibly to *Nephrodium Serra*, which is on the same sheet. This is one of the most distinct of Jamaican species, but it is rarely correctly distinguished in herbaria.

Nephrodium patens Desv.

59. *Filix non ramosa major*, &c., Cat. p. 20; Hist. p. 90, tab. 50, fig. 2, Herb. p. 111.—Banks of Orange River and Rio d'Oro. Possibly this is *N. macrourum* Baker, but the fronds are too much mutilated to show with certainty.

Neprodium molle Desv.

60. *Filix non ramosa minor*, &c., Cat. p. 20; Hist. p. 90, tab. 50, fig. 3, Herb. p. 112.—Locality of the preceding. There are four fronds on the herb. sheet, of which that on the lower right-hand side is the one the figure was taken from. The others are *N. patens* (1), and *Polypodium tetragonum* (2).

Nephrodium macrourum Baker (*forma*).

61. *Filix non ramosa minor*, &c., Cat. p. 20; Hist. p. 91, tab. 52, fig. 1, Herb. p. 113.—"Banks of Rio Cobre, below the town of St. Jago de la Vega" (now Spanish Town). This figure Grisebach cites for *N. patens*.

Nephrodium patens Desv.

62. *Filix non ramosa minor*, &c., Cat. p. 20; Hist. p. 91, tab. 52, fig. E, Herb. p. 114.—A very young plant, specifically recognised by its creeping rootstock.

Nephrodium sanctum Baker.

63. *Filicula non ramosa minima*, &c., Cat. p. 20; Hist. p. 91, tab. 49, fig. E, Herb. p. 115. *Polypodium* Sw., *Aspidium* Mett., *Acrostichum* Linn.

Acrostichum (*Polybotrya*) *osmundaceum* Hook.

64. *Filix non ramosa scandens*, &c., Cat. p. 20; Hist. p. 91, Herb. p. 116.—"Trunes of Trees in going up the sides of Mount Diablo, Archer's Ridge, &c.

Gymnogramma calomelanos Klf.

65. *Filix non ramosa minima*, &c., Cat. p. 20; Hist. p. 92, tab. 53, fig. 1, Herb. p. 119. *Acrostichum ebeneum* Linn.—A young plant.

Gymnogramma calomelanos Klf.

66. *Filix non ramosa major*, &c., Cat. p. 20; Hist. p. 92, tab. 30, fig. 2, Herb. p. 120.—"On Rocks upon the Banks of Orange River and Rio d'Oro, near Mr. Philpot's Plantation in the North side.

Asplenium montverdense Hook.

67. *Ruta murariæ accedens*, &c., Cat. p. 21; Hist. p. 92, tab. 52, fig. 3, Herb. p. 121. — "Among the Rocks on the Banks of Rio d'Oro, between sixteen Mile Walk and St. Maries."

Asplenium cicutarium Swartz.

68. *Ruta murariæ accedens*, &c., Cat. p. 21; Hist. p. 92, Herb. p. 122.—Same locality as the preceding. Sloane notices the bright rusty-brown colour which the abundant fructification gives to the under surface of this species.

Pteris heterophylla Linn.

69. *Ruta muraria major*, &c., Cat. p. 21; Hist. p. 93, tab. 53, fig. 2, Herb. p. 123.—"Banks of Orange River and Rio d'Oro, in the middle of the Island."

Asplenium cuneatum Lam.

70. *Ruta muraria maxima*, &c., Cat. p. 21; Hist. p. 93, tab. 46, fig. 2, Herb. p. 124.—"Rocky Banks of Orange River and Rio d'Oro."

Nephrodium excultum ? Hook.

71. *Filix non ramosa minor*, &c., Cat. p. 21; Hist. p. 93, tab. 54, fig. 1, Herb. p. 126.—This is a young state, quite barren, of a species that I do not recognise with certainty. The stipites are tufted, erect, from a decumbent erect rootstock. Fronds tripinnatifid; the ultimate segments ovate or ovate-oblong, and bluntly dentate in the outer part. Texture subcoriaceous and surface glabrous. The largest frond in the figure looks tripartite, and suggests *Nephrodium funestum* Hook., but the specimen from which it was taken shows that it is a bit of patch-work made up of three portions of fronds. The smaller fronds show the real shape. The texture is thicker, and the segments are less deeply cut and less sharply and deeply dentate than *N. effusum* Baker.

Adiantum villosum Linn.

72. *Adiantum nigrum maximum*, &c., Cat. p. 21; Hist. p. 93, tab. 55, fig. 1, Herb. p. 127.—Shady Gully's Banks beyond Troopers' Quarters near the Town of St. Jago de la Vega. Sloane remarks:—"Piso commends this, and says that 'twas commonly used in Brasil for Expectorating tough Phlegm, and for other the uses, are usually made of European Maiden.Hair."

[73, Cat. p. 21, Hist. p. 94, Herb. p. 128, is the same species.]

Adiantum triangulatum Hook.

74. *Adiantum nigrum minus non ramosum*, &c., Cat. p. 21; Hist. p. 94, Herb. p. 129.—Archer's Bridge. The specimen is not in fruit.

Adiantum Kendalii Jenman (= *A. macrophyllum* Sw., var. *bipinnatum* Baker).

75. Cat. p. 21; Hist. p. 94, tab. 55, fig. 2, Herb. p. 130.—Archer's wood and other the inland woody parts of the Island. The specimen is a fragment with most of the segments removed, but it shows the bipinnate state at the base. The top only, where it is perfect, was figured. The figure is quoted by Grisebach for *A. lucidum* Swartz (Gr. 'Fl. Brit. W. Ind.' p. 663).

Adiantum striatum Swartz.

81. *Adiantum nigrum non ramosum majus*, &c., Cat. p. 21; Hist. p. 95, Herb. p. 131.

Adiantum fructuosum Spreng.

There is a perfect frond of this, which is new to Jamaica, but common in Guiana and Brazil, on the sheet with the preceding species.

Cheilanthes (*Adiantopsis*) *radiata* R. Br.

82. *Adiantum nigrum majus non ramosum*, &c., Cat. p. 22; Hist. p. 95, Herb. p. 132. *Adiantum radiatum* Linn.—"Woods in the north side of the Island by the Old Town of Sevilla.'

Cyathea elegans Heward.

83. *Filix arborea ramosa*, &c., Cat. p. 22; Hist. p. 95, tab. 56, Herb. pp. 133 and 134. *Polypodium speciosum* Linn.—Sloane describes this as having a "Trunc twenty feet high, as big as ones Leg, (after the manner of Palm-Trees), undivided, and covered with the remaining ends of the Foot-Stalks of the Leaves fallen off, which are dark brown, as big as ones Finger, two or three inches long, thick-set with short and sharp prickles. . . . . From these Trees growing on the Mountains of Hispaniola, the Spaniards argued the fertility of that Soil, making Ferns grow to such a vast bigness, which in Europe were so inconsiderable, not considering that the Ferns in Europe and here, were quite different Kinds one from the other." The figure is quoted under *Alsophila nitens* J. Sm. in Gr. 'Fl. Brit. W. Ind.' p. 705.

Davallia inæqualis Kze.

84. *Adiantum nigrum ramosum maximum*, &c., Cat. p. 22; Hist. p. 96, tab. 57, figs. 1 and 2, Herb. p. 135.—Sides of Mount Diabolo, very plentifully. With this, plts. p. 137, is included portions of frond of *Dicksonia cicutaria* Swartz.

Dicksonia rubiginosa Klf.

85. *Adiantum nigrum ramosum maximum*, &c., Cat. p. 22; Hist. p. 96, tab. 57, fig. "3" (?), Herb. p. 136.—"Banks of Rio d'Oro and Orange River going to St. Maries, in the North side. This and species 87 were confused by Sloane. On tab. 57 there are three figures; 1 and 2 are cited for species 84. In the text under 85 he refers to tab. 57, fig. 3, as above quoted, but the form there figured is his species 87. The figure of 85 must have been dropped out for want of room on the table, and the requisite change not made in the text. The figure is quoted by Grisebach, 'Fl. Brit. W. Ind.' p. 691, for *Aspidium ampleus* Mett., and Kunze named it *Polypodium Sloanei*. Herb. p. 137, is given with this, but it is *D. cicutaria* Swartz.

Trichomanes scandens Linn.

86. *Adiantum ramosum scandens*, &c., Cat. p. 22; Hist. p. 96, tab. 58, Herb. p. 138.—"On the Truncs of the large Trees on Mount Diablo and Archer's Ridge." At present this only grows on the trunks of *Cyathea elegans*, which, however, Sloane may have meant, except where it ascends beyond the range of that species.

Hymenophyllum hirtellum Swartz.

Herb. p. 139 is given with the preceding.

Nephrodium effusum Baker.

87. *Adiantum nigrum ramosum maximum*, &c., Cat. p. 22; Hist. p. 97, tab. 57, fig. "4" (?), Herb. pp. 142, 143, 144. *Polypodium divergens* Sw.—Mount Diabolo. There is no fig. 4 to the plate. See species 85.

[88, Cat. p. 23, Hist. p. 97, plts. p. 145; and 89, Cat. p. 23, Hist. p. 97, tab. 54, fig. 2, Herb. p. 146, are the same as the preceding, the last being merely a very young state.

Cheilanthes microphylla Swartz.

90. *Adiantum nigrum ramosum minus*, &c., Cat. p. 23; Hist. p. 98, tab. 13, fig. 2, Herb. p. 147.—Rocks below the town of St. Jago de la Vega.

Adiantum tenerum Swartz.

91. *Adiantum sive capillus Veneris*, &c., Cat. p. 23; Hist. p. 98, Herb. p. 151.—Brought home by James Harlow. This might well be taken for *A. Capillus veneris* in those days, but it is simply *A. tenerum* in a young state.

Adiantum tenerum Swartz and *A. fragile* Swartz.

92. *Adiantum nigrum majus*, &c., Cat. p. 23; Hist. p. 98, Herb. p. 152.—"On the sides of a shady woody Gully, beyond Troopers' Quarters" (St. Jago de la Vega). The two species were not discriminated by Sloane; they are mounted on the same sheet, the former a frond, and the latter an entire plant, less the pinnules, all of which have dropped but four.

Adiantum trapeziforme Linn.

93. *Adiantum nigrum ramosum maximum*, &c., Cat. p. 23, Hist. p. 98, tab. 59, Herb. p. 153.—"Grew in the more inland large Woods of this Island."

Acrostichum (*Polybotrya*) *osmundaceum* Hook.

94. *Filix ramosa maxima scandens*, &c., Cat. p. 23; Hist. p. 98, tab. 60, Herb. pp. 154, 155.—Inland woods on the sides of Mount Diabolo and Archer's Ridge, very plentifully. 154 is a large barren frond 3 ft. long, devoid of stipe, and 2½ ft. wide, and bipinnatifid. Sloane describes the fronds as 5 ft. long and branched a foot from the base. His measurements must not, however, be taken as very definite, for in his preface he says:—"I measured their several parts by my Thumb, which, with a little allowance, I reckoned an inch."

Davallia fumarioides Swartz.

95. *Filix ramosa major*, &c., Cat. p. 23, Hist. p. 99, tab. 61, Herb. pp. 156, 157.—"Near the open ground by Rio d'Oro, near Mr. Philpot's Plantation." *Adiantum aculeatum* Linn.; but this specific name is accepted now for the other Jamaican species, which grows at a higher altitude than this, and for which Grisebach has quoted the figure.

Aspidium apiifolium Schbr.

96. *Filix ramosa major*, &c., Cat. p. 23; Hist. p. 99, Herb. pp. 157, 158, 159.—In all the inland woods of the Island.

Pteris Kunzeana Agardh.

97. *Filix ramosa major*, &c., Cat. p. 23; Hist. p. 100, Herb. p. 162.—It grew on the inland parts of this Island. Sloane remarks:—"The Powder [spores] on the back side of the leaf is commended by Piso in ill Ulcers."

Pteris laciniata Willd.

98. *Filix ramosa major hirsuta*, &c., Cat. p. 23; Hist. p. 100, Hebr. p. 163. *Lonchitis hirsuta*.—Banks of the Rio d'Oro; St. Maries in the north side.

Aspidium cicutarium Swartz.

99. *Filix ramosa minor hirsuta*, &c., Cat. p. 24; Hist. p. 100, Herb. p. 164.—Brought home by James Harlow.

Dicksonia cicutaria ? Swartz.

100. *Filix ramosa major*, &c., Cat. p. 24; Hist. p. 101, tab. 62, Herb. p. 165.—Inland woody parts of the Island. Probably correct, but the specimen was taken in an early stage, and is most fertile.

Pteris caudata Linn.

101. *Filix fœmina seu ramosa major*, &c., Cat. p. 24; Hist. p. 101, Herb. p. 166.—Inland Savannas of the Island.

[102, Cat. p. 24, Hist. p. 101, tab. 63, Herb. p. 167, is a rather larger state than the preceding of *Pteris aquilina* Linn.]

Gleichenia dichotoma Willd.

103. *Filix fœmina seu ramosa major*, &c., Cat. p. 24; Hist. p. 102, Herb. p. 168.—Moneque Savanna.

[End of numbered species.]

Addenda.

Nephrodium scolopendrioides Hook.; *Polypodium hastæfolium* Swartz.

Herb. p. 54.

Asplenium abscissum Willd.

Herb. p. 58.

Pteris grandifolia Linn.

Herb. p. 85. Dr. Houston ex Jamaica, 1730.

Nephrodium macrourum Baker.

Herb. p. 109, and an unnumbered page next preceding from Dr. Houston. These were supposed by Sloane to belong to his No. 57 (*Nephrodium Sloanei* Baker).

Hymenophyllum (Septocionium) **Houstonii** Jenman, n. sp.

Rootstock and stipites not seen. Fronds lanceolate, broadest below, 4 in. long, 1½ in. broad, tripinnatifid. Pinnæ subdistant, obliquely spreading, 1—1¼ in. long, ½ in. wide at the base. Pinnulæ lax, 1—3 times forked. Ultimate segments divergent, linear, ½ line broad, 1—2 lines long, a single vein in each. Rachis filamentous, winged throughout, of equal width with the other parts. Margins spinulose and slightly crushed. Fructification not seen. Hebr. p. 140. There are two imperfect fronds of this on the sheet without any remark. The species comes nearest *H. tortuosum* Hk. & Gr. of temperate South America.

Selaginella serpens Spring.

Cat. p. 12; Hist. p. 68, Herb. p. 24.

Equisetum giganteum Linn.

Hist. p. 70. Herb. p. 31.

There are a few Madeiran and Nevis species in the collection, which, except the one or two ascribed in error to Jamaica, I have left unnoticed.

The following is an index to the arrangement, based on the sequence of the 'Synopsis Filicum.' The species without numbers belong to the addenda :—

Gleichenia
dichotoma, 103
Cyathea
elegans, 83
Trichomanes
punctatum, 12
sphenoides, 12
muscoides, 12
pusillum, 12
scandens, 86
Hymenophyllum
hirtellum, 86
Houstonii
Dicksonia
rubiginosa, 85
cicutaria, 100
Davallia
Sloanei, 54
inæqualis, 84
fumarioides, 95
Adiantum
macrophyllum, 34
Kaulfussii, 34
Kendalii, 75
pulverulentum, 33
villosum, 72, 73
fruticosum, 81
triangulatum, 74
striatum, 81
trapeziforme, 93
tenerum, 91, 92
fragile, 92
Cheilanthes
radiata, 82
microphylla, 90
Pellæa
geraniæfolia, 9
Notholæna
trichomanoides, var. [subnuda, 31
Pteris
longifolia, 27
heterophylla, 69
caudata, 101, 102
laciniata, 98
Kunzeana, 97
grandifolia
Lomaria
procera, 47

Blechnum
occidentale, 48
Asplenium
serratum, 5
formosum, 35
dentatum, 36
abscissum
cuneatum, 70
auritum, 25, 26
montverdense, 67
cicutarium, 68
celtidifolium, 38
arboreum, 24
Aspidium
semicordatum, 47
triangulum, 32
viviparum, 32
trifoliatum, 12, 43
macrophyllum, 50
cicutarium, 99
apiifolium, 96
Nephrodium
effusum, 87
excultum, 71
sanctum, 63
macrourum, 61
patens, 56, 59, 62
Sloanei, 57
Serra, 55
molle, 60
usitatum, 58
amboinense, 45, 46
scolopendrioides
Nephrolepis
exaltata, 22
Fadyenia
prolifera, 3
Polypodium
elasticum, 30
pectinatum, 29
simile, 23
hastæfolium
reptans, 21
crenatum, 44
obliteratum, 44
tetragonum, var., 44
megalodus, 44
incanum, 28
aureum, 19
Phyllitidis, 4
piloselloides, 11
lycopodioides, 11
Meniscium
angustifolium, 41
Gymnogramma
rufa, 49
trifoliata, 51
calomelanos, 65, 66
Hemionites
palmata, 8
Acrostichum
nicotianæfolium, 40
aureum, 20
sorbifolium, 39
cervinum, 37, 42
osmundaceum, 64, 94
Anemia
hirsuta, 2
adiantifolia, 1
Lygodium
volubile, 52
venustum, 53
Danæa
nodosa, 43
Selaginella
serpens
Equisetum
giganteum

ON THE RELATION OF THE BRITISH FORMS OF RUBI TO THE CONTINENTAL TYPES.

By J. G. Baker, F.R.S.

(Continued from p. 7.)

In the present paper I propose to deal with the range of forms characterised by hairy barren stems and equal prickles. As before, the groups and numbers are those of Nyman's 'Conspectus.'

Group 3.—Candicantes.

10. *R. thyrsoideus* Wimm.—This is marked by its high-arching stems, barren stem angled and quite glabrous when mature, leaflets twice as long as broad, not nearly so white beneath as in *discolor*, a long lax narrow panicle protruded beyond the leaves in its upper part, with a densely pubescent rachis, with very few very small hooked prickles, and by its white flowers. As will be seen in Nyman's 'Conspectus,' it is widely spread on the Continent, extending from Central and Southern Russia to Spain, West France, and Scandinavia, and includes a large number of sub-ordinate forms which have been published with specific names. I had an opportunity of seeing it alive this autumn in the Rhine Valley, near Konigswinter, and have received numerous dried specimens from Dr. Focke and other continental correspondents. In his 'Synopsis' Dr. Focke cites *thyrsoideus* of Babington as a synonym of *R. pubescens* W. & N., and he has also referred to

pubescens the common London plant we have always called *thyrsoideus* and a plant I sent him several years ago from the Isle of Wight as typical for *thyrsoideus*, as defined in Hooker's 'Students' Flora.' I have myself certainly never collected the genuine *thyrsoideus* in Britain, but see no reason to doubt the Devonshire plant gathered by Mr. Briggs between Tamerton and Roborough (mentioned in 'Flora of Plymouth,' p. 115) being the true plant, as understood by Nyman.

11. *R. arduennensis* Libert. — What I have as *arduennensis* from France and Germany is like *thyrsoideus* in the panicle; but the leaflets are rounded and more densely pubescent, and less white beneath. Dr. Focke, in his 'Synopsis,' cites doubtfully under *arduennensis* the *R. discolor* var. *pubescens* of Babington, but I feel satisfied that this is not the right place for it.

Group 4.—Villicaules.

13. *R. discolor* of Nyman & Babington, but not of W. & N. Rubi Germ. t. 20.—Taking England as a whole, I suppose what all our recent authors have agreed to call *discolor* is the commonest fruticose bramble we possess. In some places in the South of England, as, for instance, along the Undercliff in the Isle of Wight, it has the abundant bramble-thickets for miles of country almost entirely to itself. I did not fully realise till this autumn how essentially for Europe as a whole this was, like *Ulex* or *Erica*, a characteristically southern and western type. It is abundant enough in France and Switzerland, and all through the Mediterranean region. It extends from Portugal and the Azores as far east as Persia and Afghanistan, and across the Mediterranean basin to Algeria and Morocco. In Belgium I saw it as far east as Spa, and it is said to just cross the German frontier at Aix-la-Chapelle; but I saw it nowhere in Germany, and Dr. Focke tells me it is entirely absent from the Rhine Valley and *a fortiori* from further east. The plant figured as *discolor* by Weihe & Nees came from the neighbourhood of Bonn, and is *R. macrostemon* Focke, placed by Nyman as a subordinate form of *R. pubescens*. The present plant does not reach Denmark and Scandinavia. It is common enough in North Yorkshire, but is quite absent from the central portion of the Lake district about Keswick, Ambleside, and Coniston. The oldest name for it published with a proper diagnosis is *R. ulmifolius* Schott in Isis, 1818, p. 821, and this is adopted by Focke and the recent Swiss botanists. To the synonyms cited by Focke (which include *R. abruptus* Lindl. Synops. Brit. Flora, p. 92, 1829) several of Genevier's will have to be added.

R. discolor var. *pubescens* Bab., which recedes from the type in the direction of *leucostachys*, is, I think, essentially identical with the South European *R. Linkianus* Gussone. It grows abundantly on the left-hand side of the road between Virginia Water Station and the Wheatsheaf Inn.

14. *R. bifrons* Vest. (*R. speciosus* Mull.; *R. rhamnifolius* Wirtg., non W. & N.). — This differs from the last by its non-pruinose barren stem and pubescent panicle-rachis, with slender straight

prickles. It is a common Swiss bramble, and I saw it growing in abundance this autumn in the neighbourhood of Heidelberg. There are one or two characteristic bushes inside the courtyard of Heidelberg Castle, so that it is sure to come under the notice of any tourist who is at all on the look-out for plants. Nyman places under this a subordinate form, *R. Lindenbergii* Muller, which is the Danish and Scandinavian *discolor* of Arrhenius & Fries (Summa p. 165, and Herb. Norm. vii. 48).

15. *R. pubescens* W. & N., Rubi Germ. t. 16. — This is one of the commonest Rubi of Surrey, and is the *thyrsoideus* of Brewer's 'Surrey Flora' and the plant so called in Hooker's 'Students' Flora.' As dealt with by Nyman it covers a wide range of forms, including *R. Winteri* and *argentatus* of Muller, and *R. geniculatus* of Kaltenbach, to which Dr. Focke has referred British specimens, and also *R. macrostemon* Focke (which = *R. discolor* W. & N., Rubi Germ. t. 16, and the plant issued as *R. robustus* in Wirtgen's 'Fasciculus'), and probably *R. argenteus* W. & N., Rubi Germ. tab. 19. The position of this present type is midway between *ulmifolius and villicaulis*. I saw it this autumn in abundance both in Belgium and Germany. According to Dale, in the Herbarium of the British Museum, it is the *Rubus morus* of Merrett's Pinax, p. 106. It is interesting to note that as early as 1667 Merrett distinguished five Rubi in Britain in addition to *R. Idæus*, two of the others being apparently *cæsius* and *corylifolius*.

16. *R. villicaulis* Koehl.; W. & N., Rubi Germ. t. 17. — Dr. Focke admits as genuine *villicaulis* a bramble frequent on the Surrey Heaths which we have all along been calling by the same name. I saw the same plant in plenty this autumn, in the Rhine country, in the woods of the Siebengebirge. He has recently referred to *R. gratus* Focke, a Surrey bramble gathered by Mr. Beeby, and doubtfully to *R. rhombifolius* Weihe, a Herefordshire plant sent by the Rev. A. Ley. Both these and also *R. umbrosus* Weihe are classified under this type by Nyman. The aciculate variety of *villicaulis* described by Babington (*derasus* Mull. = *adscitus* Genev. = *Bakeri* Blox.) is not mentioned by Nyman.

16*. *R. umbrosus* Arrhen. ex parte, and Hooker's 'Students' Flora' (*R. carpinifolius* Blox., non W. & N.; *R. macrophyllus* α. *umbrosus* Bab.). — This is one of our commonest and most widely-distributed British brambles, and yet I can say very little that is definite about its relationship to continental types. Arrhenius did not publish the plant as a new species, but merely took up the name from the *Rubus vulgaris* β. *umbrosus* of Weihe & Nees, described Rubi Germanici, p. 39, and figured, and end leaflets only, on tab. 14. According to Focke, this is *R. pyramidalis* Kalt., shortly to be noticed. The plate in 'Flora Danica' (tab. 1163), cited by Fries, certainly does not represent the present plant, but what is issued as *umbrosus* in the 'Herbarium Normale' of Fries is, I think, identical with our common plant. I have not seen it either alive or in the form of dried specimens from Belgium, France, or Germany. I should like to class our plant as a distinct subspecies, intermediate between *macrophyllus* and *rhamnifolius*, not under *villicaulis*,

of which *umbrosus* is placed as a subordinate form by Nyman. This I believe is the position of a Surrey plant lately named *R. Neumanni* by Dr. Focke for Messrs. Bennett and Beeby, and most likely also of *R. leucandrus*, mentioned by Focke as probably British.

17. *R. macrophyllus* W. & N., Rubi Germ. t. 12. — Here all recent authors seem to be in unison, and to agree in placing *Schlechtendahlii*, *piletostachys*, and *amplificatus* as subordinate forms. I saw plenty of it in the Rhine Valley this autumn. It occurs in fine condition near the pillar and chalet on the summit of the Konigstuhl, at an elevation of nearly 2000 ft. above sea-level.

18. *R. sylvaticus* W. & N., Rubi Germ. tab. 15. — About this as a British plant I am completely puzzled. Nyman and Focke cite as synonyms *rubeolus* of Hooker's 'Students' Flora,' *Salteri* Bab. ex parte, *calvatus* Blox., and *foliosus* Bab., non W. & N. Babington's *foliosus* seems to me entirely out of place in this present group, and I cannot reconcile Bloxam's *calvatus* with the figure of *sylvaticus* in 'Rubi Germanici.' *R. calvatus* I should like to class as a distinct subspecies of this present group, coming in between *villicaulis* and *rhamnifolius*. The claims of the present type to be registered as British need further investigation.

19. *R. Sprengelii* W. & N., Rubi Germ. t. 10; Fl. Dan. t. 1697. — This is a well-marked bramble, with a rather restricted continental range, about which all recent authors seem to be in accordance. In the neighbourhood of Spa our ordinary British *Sprengelii* is one of the commonest brambles, growing in open heathy woods. The Danish and North German *R. Arrhenii* Lange (figured 'Flora Danica,' tab. 2720), kept up as distinct by Nyman, differs mainly from the large *Borreri* of the Surrey heaths by its orbicular petals and short stamens, and will probably be found in Britain. The very local *R. rubicolor* Bloxam appears to be intermediate between *Sprengelii* and *calvatus*.

Besides these, I should prefer to classify with the *Villicaules* the following, which are placed in other groups in Nyman :—

23. *R. leucostachys* Schleich. = *R. vestitus* W. & N., Rubi Germ. t. 33.—I saw, both in Belgium and the Rhine Valley, a plant that agreed entirely with our typical British *leucostachys*. It has a wide continental distribution, extending from Denmark (not Scandinavia proper) and the West of France to Transylvania and the Tyrol. *R. hirsutus* Wirtg., which I gathered, in addition to the type, near Spa, appears to be substantially the same as *R. Leightonianus* Bab. *R. conspicuus* Muller recedes from the type in the direction of *pubescens*. *R. macrothyrsos* Lange (figured 'Flora Danica,' tab. 2832) is a very elegant variety with a large lax inflorescence and red petals, which should be looked for in Britain.

23*. *R. pyramidalis* Kaltenb. Fl. Aachen, p. 275 (1845), non Bab. (1849) = *R. vulgaris* β. *umbrosus* W. & N. = *R. umbraticus* and *hirtifolius* Wirtg. — Although I saw this in plenty, in September, not far from its original Aachen home in the neighbourhood of Spa, I am afraid I have not learnt yet to individualise it clearly. But, so far as I can judge, I should suppose its affinity to be with *villicaulis* and *umbrosus*, and not with *leucostachys*, and its place to be in this present group as one of the *silvaticus* set of forms.

R. mucronatus Bloxam.—This is not mentioned by Nyman, but *R. mucronulatus* Boreau, of Central France, supposed to be the same plant, is placed in the 'Conspectus' in the midst of the glandulose Rubi under *R. hirtus* W. & N. Bloxam's *mucronatus* is a plant I saw alive regularly year after year in its typical form in North Yorkshire, and I entirely agree with Prof. Babington in classifying it in the neighbourhood of *villicaulis* and *calvatus*. I do not see any good reason for changing Bloxam's very appropriate name of *mucronatus*, as applied to the present plant. As long ago as 1840 Torrey and Gray showed that the North American *R. mucronatus* Seringe was a mere synonym of *R. triflorus* Richards. (which is a near ally of *R. saxatilis*), so that the name stood vacant when Bloxam used it in 1850. If I may judge from a single specimen from Dr. Ripart, the French *mucronulatus* is not entirely identical with our plant, but differs from it by its more prickly panicle and less cordate end-leaflet. The genuine *mucronatus* is a very clearly-marked type, and although it is widely spread in Scotland and the Northern and Midland Counties of England, I have never seen it from the South of England or from any continental locality. Years ago, in company with Dr. Boswell, I collected along with the type in Arran a strongly aciculate variety, bearing the same relation to the type that *adscitus* and *derasus* bear to *villicaulis*, and *vestitus* to *leucostachys*. *R. Grabowskii* Bab., not W. & N. (Bloxam's plant), should be compared with *R. horridicaulis* Muller, of which there are fine specimens in Boulay's 'Rubi of the Vosges,' No. 14 *bis*. The place of this is, I think, between *pubescens* and *infestus;* and of *R. Colemanni* Blox. between *calvatus* and *infestus*.

Group 5.—Tomentosi.

21. *R. tomentosus* Borckh. — I had the opportunity for the first time this autumn of seeing this growing plentifully in the Valley of the Neckar, above Heidelberg. The type is a most distinct plant, but it appears to run off into other things in all directions, and to complicate the German brambles in a way that we are thankful to be spared from in England. It appears to be essentially a dry country type, needing greater heat in summer than we get in England. It reaches, however, Belgium and Brittany, so that it should be looked for in the chalk-districts of the South of England.

(To be continued.)

IRISH HAWKWEEDS.

By H. C. Hart.

The following is a list of the *Hieracia* which have been collected by me during the past five years in various parts of Ireland. Their identification is entirely due to Mr. James Backhouse, of York, to whom specimens from all the undermentioned localities have been submitted :—

Hieracium cerinthoides Backh. — *α.* Slieve League, Donegal; Tullymore Park, Down; Carlingford Mountain, Louth; Galtees, Tipperary; Macgillycuddy's Reeks, Kerry .— *β, anglicum.* Slieve League and Ardara, Donegal; Tullymore Park, Down; Carlingford Mountain, Louth; Salrock and Muckanaght [Twelve Bens], Galway; Westport and Croaghpatrick, Mayo; Comeraghs, Waterford; Brandon and Macgillycuddy's Reeks, Kerry.

H. iricum Fr.—Coolcross [Innishowen], River Finn, River Erne [on limestone] and *(St. John's Point), on limestone, Donegal; Benchoona [Salrock], Kylemore, Galway.

H. pallidum Fr.—Aghla Mountain [Finntown], Donegal; (Carlingford Mountain), Down.

H. argenteum Fr.—Moynalt near Laghy and (Glenalla), Donegal; mountain-stream in Mourne Mountains near Rosstrevor, Down; Muckanaght [Twelve Bens], Maumeen [Maam Turk], Galway.

Note.— Referring to specimens from Mourne Mountains, Mr. Backhouse writes, "Possibly new, probably forms of *H. argenteum*, but very remarkable," and "a new form to me." By Backhouse's request I sent them to Prof. Babington, who writes, "Is certainly the most remarkable *H. argenteum* that I have ever seen. But I agree with Mr. Backhouse that that is its place." The locality is Broughnamaddy, by the Causeway Water. The specimens from Moynalt approach those from the Mourne Mountains tolerably closely, and of the former Mr. Backhouse has no doubt. Of the latter the most noticeable peculiarities are—the stem leafy, with about five leaves, the uppermost about 2–3 in. long, lower 3–4 in.; all stem-leaves about eight times as long as broad, very pointed and tapering at both ends, remotely or not at all toothed; texture glabrous, satiny and silvery; radical leaves shorter, more elliptic, about four times as long as broad, hardly toothed; all the leaves tapering to a footstalk; flower-heads large and bright, 1, 2, or 3 to stem; veins of leaves very conspicuous. The Glenalla specimens were gathered too late in the year for satisfactory identification. The Galway plant is nearer the type. This species has not been previously found in Ireland.

H. murorum Linn.—Ben Evenagh, Londonderry.

Note.—I have also gathered this species near Glenalla, Donegal.

H. cæsium Fr.—Coolcross, in the north of Innishowen, Donegal; Dargle, Wicklow.

H. vulgatum Fr.—(Finn River), Donegal; Owenrigh River near Dungiven and Ben Bradagh, Londonderry; Tullymore Park, Down.

H. gothicum Fr.—Killybegs River, Donegal.— ? Var. *angustifolium.* Killybegs River, Donegal. — Var. *latifolium.* Finn River, Carrick River (Owenee River and Kiltooris Lake, near Ardara), Donegal; Tullymore Park, Down.

Note. — Of specimens from Carrick River, besides the normal form, Mr. Backhouse writes, "Seems nearest to *H. norvegicum* Fr.; heads far too numerous for *H. gothicum.* Texture of leaves and almost entire absence of hairs is remarkably different. Peduncle

---

* Those encircled by curved brackets ( ) were bad or doubtful specimens.

with too many bracts." By Mr. Backhouse's request these were submitted to Prof. Babington, who places them here. I have since found the same plant by the Mournebeg River, at the southern edge of the county. It is undoubtedly a distinct form, but I dare not add another name to the unwieldy list of hawkweeds.

H. umbellatum Linn. — Glenties and Lough Eske, Donegal.— ? Var. *filifolium*. Lough Eske, Donegal.

Note.—This unmistakable species is common by all the mountain streams in Western Donegal.

H. crocatum Fr. — Sea-banks at Glennagiveney in Innishowen and Mournebeg River, Donegal; Owenrigh River near Dungiven and Tullymore Park, Derry; in a glen at the northern base of the Carlingford Mountain, Louth.

H. boreale Fr.—Glenmalure, Wicklow.

H. corymbosum Fr.—Banks of the Barrow at Graignenamanagh, Carlow.

Note. — This is, I think, the species along the river above Laragh and below Ballinaclash, in Wicklow. I have not as yet secured specimens.

H. rigidum Fr.—In a glen above Omeath, on the northern flanks of the Carlingford Mountains, Louth.

These will tabulate thus into the Districts of the 'Cybele Hibernica':—

H. cerinthoides Backh., α., 1, 2, 5, 11, 12.
β. *H. anglicum*, 1, 2, 5, 6, 11, 12.
H. iricum Fr., 6, 11
H. pallidum Fr., 5, 11.
H. argenteum Fr., 6, 11, 12.
H. murorum Fr. (11), 12.
H. cæsium Fr., 4, 11.
H. vulgatum Fr., 11, 12
H. gothicum Fr., 11.
Var. *angustifolium*, 11.
Var. *latifolium*, 11, 12.
H. umbellatum Linn., 11.
H. crocatum Fr., 5, 11, 12.
H. boreale Fr., 4.
H. corymbosum Fr., 3, (4).
H. rigidum Fr., 5.

HOOKERA v. *BRODIÆA:*

WITH SOME REMARKS ON NOMENCLATURE.

By James Britten, F.L.S.

In the 'Genera Plantarum' (iii. 800) *Hookera* of Salisbury* (Parad. Lond. t. 98) is placed as a synonym of *Brodiæa* of Smith (Linn. Trans. x. 2, t. 1). I desire to show that the position of these names should be reversed.

Salisbury's two species of *Hookera* were published, according to the date on the plate of *H. coronaria*, on March 1st, 1808. The paper in which Smith established *Brodiæa* was not *read* until

* The usually accurate Pfeiffer cites this as "*Hookeria* Salisb. 1809,"—which is incorrect both as to name and date.

April 19th of the same year, and that he was quite aware of Salisbury's prior publication is shown by the fact that he cites his *Hookera* as a synonym.

Probably the universal acceptance of Smith's name is due to the fact that about the same time he established the well-known genus of mosses, *Hookeria**; and the resemblance of the two names may have been considered too close. But, if so, *Hookeria* and not *Hookera* must go to the wall: for the latter was published more than a month before the paper establishing the former was read (April 5th, 1808).

It is not, then, to be wondered at that Salisbury should express himself strongly as to Smith's conduct in the matter; and, whatever view may be taken of the antagonism which existed between them, it is impossible not to feel that he had grounds for so expressing himself. Accordingly, in the 'Paradisus,' t. 117, when describing *H. pulchella* more fully, he states that *H. coronaria* had been named by him in June, 1807, and published in March, 1808; and then proceeds to animadvert on Smith as follows:—

"When Dr. J. E. Smith came to London in May following, at a meeting of the Linnean Society he read the generic character of a Moss, which he thought proper to name *Hookeria*, after an excellent cryptogamist; and at a subsequent meeting he read his own generic character of my *Hookera*, made up from dried specimens and drawings given to him by Mr. Menzies, naming it *Brodiea*, after one of his patrons. Notwithstanding what he then said respecting the affinity of these two plants, such was the impression made upon several of the members present by the drawings which were produced that they immediately exclaimed the genus was allied to *Allium*, and this without knowing that I had already published a similar opinion, or had named the genus *Hookera*, a circumstance respecting which Dr. J. E. Smith, to suit his own purpose, was utterly silent. It is of little importance which of these names is adopted by future botanists; for, if my ideas respecting the genus are right, they will be confirmed in spite of all Dr. J. E. Smith's opposition, whose multiplied acts of injustice to me, whether open or concealed, I sincerely forgive." †

The genus, as defined in the 'Genera' (iii. 800) and by Mr. Sereno Watson (Proc. Amer. Acad. xiv. 236), includes many species

---

* He dedicates this to his "young friend, Mr. William Jackson Hooker, of Norwich, F.L.S., a most assiduous and intelligent botanist, already well known by his interesting discovery of *Buxbaumia aphylla*, as well as by his scientific drawings of *Fuci* for Mr. Turner's work; and likely to be far more distinguished by his illustrations of the difficult genus *Jungermannia*, to which he has given peculiar attention. The reticulated habit of this his favourite genus accords with what is most remarkable in any *Hookeria*" (Trans. Linn. Soc. ix. 275).

† Further animadversions by Salisbury, not unmixed with personal attack, will be found in his 'Genera,' p. 86. "What will an impartial historian say," he asks, "if he compares the benefits Botany has derived from the rich owner of Brodie House, with those figures which entitle William Hooker's name to descend to posterity in the glorious company of Robert's, Joubert's, Aubriet's, Basseporte's, Merian's, Spaendoch's, Elnet's [Ehret's], Sowerby's, Redouté's, the two Bauers,' and Sydenham Edwards', another victim, alas! of Sir J. E. Smith's misrepresentations?"

referred to *Milla* by Mr. Baker, and excludes his *B. volubilis* (= *Strophilirion*) and *B. coccinea* (= *Brevoortia*). The three species left must stand as follows:—

HOOKERA CORONARIA Salisb. Parad. t. 98 (1808) = *Brodiæa grandiflora* Sm. in Linn. Trans. x. 2 (1811).
H. PULCHELLA Salisb. *l. c.* t. 117 = *B. congesta* Sm. *l. c.* p. 3.
H. MULTIFLORA = *B. multiflora* Benth. Pl. Hartw. 339.

The other plants placed under *Brodiæa* by Mr. Watson, both in Proc. Amer. Acad. and in 'Botany of California,' ii. 153, must take the generic name *Hookera*, but may retain their specific names.

Mr. Baker and Mr. Watson indicate some doubt as to the identity of *H. pulchella* Salisb. Mr. Baker doubtfully refers it to *B. congesta* Sm., and Mr. Watson (also doubtfully) to *B. capitata* Benth. I think, however, that if Salisbury's remarks be read carefully, it will be seen that Smith's *B. congesta* and Salisbury's *H. pulchella* were identical—at any rate in the opinion of the latter, who was likely to know. But any hesitation which might be felt as to the synonymy of the latter is overcome by the statement of the authors of the 'Genera,' who say, "*B. capitata* Benth. Pl. Hartw. 339, a specie typica *B. congesta* Sm. nequaquam differe videtur, nisi staminibus omnibus nec 3 solis antheriferis.* *Hookera pulchella* Salisb. Parad. Lond. t. 117, dubie ad unam alteramve refertur, et verisimiliter utramque includit."

If the law of priority has any claims to respect, there can be no ground for ignoring it on the present occasion—except, indeed, the illogical one of "convenience," which must sooner or later be abandoned. Smith's conduct was unjustifiable, inasmuch as he deliberately set aside Salisbury's name (of the existence of which he was fully cognisant) in favour of his own. It is to be regretted that all subsequent writers have condoned his offence by adopting his name, although many of them must have been aware of Salisbury's claims.

The restoration of *Hookera* is not only a tardy act of justice to Salisbury, but it brings back to nomenclature the commemoration of the able artist who planned and illustrated the 'Paradisus Londinensis.' This work contains 117 plates, and was discontinued when Hooker was appointed artist to the Horticultural Society;† other plates had been prepared, and the letterpress for them had been circulated privately to some extent, for Salisbury speaks of "the 122nd No. of Paradisus Londinensis, of which only a few copies were given by Mr. Hooker to his friends, without any figure."‡ Salisbury was believed by Sir Joseph Banks to help Hooker with money in the publication of the work.§ William Hooker (who was born in 1779‖) was a pupil—and an apt one—of Francis Bauer:

---

* Among Menzies' specimens of *B. congesta* Sm. in Herb. Mus. Brit. is one marked by Brown, "Distinct and hexandrous."

† Salisb. Gen. p. 10. ‡ *L. c.* 139.

§ Banks' MS. Correspondence Jan. 15, 1806. ‖ Salisb. Gen. p. 85.

his memory is associated by artists with the colour called after him, "Hooker's Green"; and there was a peculiar fitness in the dedication of a plant to him by the author of the descriptions in the 'Paradisus.' He engraved* and coloured† the plates for Knight's 'Pomona Herefordiensis' (1811); coloured the plates in Lambert's 'Pinetum'; and himself produced the 'Pomona Londinensis'—a far superior work—in 1813–18. He was a practical horticulturist, as is shown by several papers which he contributed to the 'Transactions of the Horticultural Society,' of which body he was a Fellow, and by which he was employed as artist,‡ the many excellent plates appearing in the 'Transactions' being a selection of those prepared by him. Thus, a Fruit Committee Report in 1812 concludes with the acknowledgment of "the greatest assistance from one of their own number, Mr. William Hooker, whose great skill in his profession. and whose quickness in seizing the true characteristic marks of each tree or fruit, have only been surpassed by the zeal and diligence which he has manifested in the pursuit";§ and Salisbury, speaking of "Ord's Apple," mentions him as knowing apples "better than any of us."‖ He lived in London, and died about the early part of 1832.¶

Salisbury finds another ground of complaint** in the substitution by Robert Brown of *Thysanotus* for his *Chlamysporum*. There can be no question as to the priority of Salisbury's name, for Brown when establishing his *Thysanotus* quotes "*Chlamysporum* Salisb. Parad. 103" as a synonym. Brown (Prodr. 282) justifies his conduct by saying, "Nomen meum, in Herbario Banksiano receptum et D. Salisburio benè cognitum cum *Chlamysporum* suum in publicâ luce emisit, retinui et eo magis quòd illius icon, quamvis in Paradiso Londinensi locum obtinuit, ad exsiccatum exemplar facta esse videtur; talis enim expansio floris vel antherarum situs minimè in hâc specie nec in ullâ generis observavi." Salisbury retorts, "To say nothing of his bad Latin, this assertion as far as concerns me is totally false; but I certainly should have opposed his selfish desires to taboo that New Holland genus, even if I had known his name; for it flowered in my own garden at Mill Hill, though he insinuates to the contrary, from Mr. Hooker's having faithfully delineated its fugacious blossoms as he saw them, not fully expanded" (Salisb. Genera, 68). *Chlamysporum juncifolium* Salisb. is the correct name of the plant usually known as *Thysanotus junceus* Brown; and the other species

---

* 'Pomona Herefordiensis,' viii. † Trans. Hort. Soc. i. 198.

‡ Salisb. Gen. p. 10. § Trans. Hort. Soc. ii. 62. ‖ *Ib.* 287. ¶ *Ib.* 2nd S. i. 246. William Hooker was in no way connected with the family of the same name who will always be inseparably associated with Kew. But the distinction is not always recognised: thus in Johnson's 'Hist. of English Gardening,' p. 284, the 'Pomona Londinensis' is attributed to Sir (then Dr.) W. J. Hooker.

** Whether Salisbury's personal unpopularity had anything to do with the wholesale ignoring of his names I do not know. I purpose shortly to bring forward other instances, like the preceding, in which he has been unjustly treated.

of *Thysanotus*, as defined in Fl. Austral. vii. 38–45, must also be styled *Chlamysporum*; their specific names may remain as at present, the terminations only being altered—thus, *T. multiflorus* Br. will become *C. multiflorum*, *T. triandrus*, *C. triandrum*, and so on.

The only possible ground for the retention of names like those which have been shown above to be antedated is that of convenience, and this is both illogical and untenable. Mr. B. D. Jackson admirably disposes of it: "The attempt to uphold certain names because we are used to them must result in ultimate failure; it is an attempt to compromise with truth, a course that can end only in a heavier penalty at some future time."* This is the view largely acted upon by Baron von Mueller in his 'Census of Australian Plants' (1882), and it is this which must ultimately prevail. It is to be regretted that the authors of the 'Genera' have in many cases deliberately set aside the earliest name in favour of one more generally received; and their example has been followed by many. Thus Mr. C. B. Clarke (Fl. Brit. India, iv. 337) connives at the suppression of D. Don's *Trichosporum* in favour of *Æschynanthus* of Jack, with the remark, "*Æschynanthus* Jack was published Jan., 1823; but *Trichosporum* D. Don, being published July, 1822, has the right of priority; *Æschynanthus*, however, having been accepted for half a century, it would not be expedient to relinquish it." It may be well to note the consequence of this deliberate wrong-doing. Mr. Clarke enumerates twenty-two species of this genus, eight of which are published for the first time. No better opportunity could have been found for restoring the proper generic name; as it is, an over-burdened nomenclature will be encumbered with a set of useless synonyms as soon as anyone shall come forward and substitute *Trichosporum Hookeri* for *Æschynanthus Hookeri* Clarke, *T. Kingii* for *Æschynanthus Kingii* Clarke, and the rest. Mr. Jackson may be trusted to set all this right in his *magnum opus*, which is steadily progressing; but he will not thank those who thus add to his labour by the introduction of needless synonyms.

A NEW CHINESE *AMOMUM*.

By H. F. Hance, Ph.D., F.L.S., &c.

Amomum (Geanthus, breviscapi) **vittatum,** sp. nov. — Rhizomate horizontaliter repente, foliis firmis ovatis acuminatis supra subnitidis albido-atroviridique vittatis subtus pallidioribus venis saturatioribus crebris percursis squamulisque consitis $3\frac{1}{2}$–6 poll. longis $2\frac{1}{2}$–$3\frac{1}{4}$ poll. latis petiolo $\frac{1}{2}$–$1\frac{1}{4}$ pollicari, vaginis ad 4 poll. longis eximie elevato-reticulatis, scapis petiolum paulo superantibus fusco-rubentibus puberulis, inflorescentia laxiuscula,

---

* Journ. Bot. 1881, 76.

bracteis oblongis vinoso-rubris puberulis calyci æquilongis, floribus pollicaribus, calyce vinoso-rubro 5 lin. longo tomentello, corollæ tubo calyce incluso lobo postico medium antherarum attingente lateralibus paulo brevioribus albidis apice rubentibus labelli trilobi lobo medio oblongo apice 4-dentato albido rubroque picto lateralibus abbreviatis linearibus retusis rubris basi glandulosis, antheræ connectivo puberulo loculum vix superante, ovario piloso.

E jugo Lo fau shan, prov. Cantonensis, retulerunt rev. E. Faber et cl. C. Ford, a. 1883. Planta jam elapso vere in hort. bot. Hongkongensi necnon in hortulo meo Cantone large florens specimina præbuit unde diagnosin composui. (Herb. propr. no, 22305.)

Distinguished by its somewhat lax inflorescence and vittate leaves; the latter character not to be seen in dried specimens.

I have another very fine species of the same group, also gathered by Mr. Faber at Lo fau shan, with broad ribbed and plaited leaves 22 in. long, borne on a petiole of equal length. It has only withered flowers and ripe fruit, with very small wrinkled black seeds, and is insufficient for description.

SHORT NOTE.

Equisetum litorale Kühlewein, in Britain.—In June last I collected, in Surrey, an *Equisetum* which seemed to differ from all of our recognised species. It lay for some time with other doubtful plants, and it was only in December that I examined the plant and concluded that it was distinct. Meantime I had availed myself of the kindness of Mr. Arthur Bennett, by including a specimen in a parcel he was sending to Professor Lange. Shortly afterwards Mr. Bennett received that botanist's report, identifying it with the above species, which stands between *E. palustre* and *E. limosum*. It may at once be separated from the former by the large hollow of the stem, which has, also, much more slender furrows; from *E. limosum* it differs by the sheaths, especially the upper ones (which are also deeply furrowed), being funnel-shaped rather than cylindrical, by its glaucous, scabrid stem, and in other ways. Its habitat presents such peculiar features, so far as Surrey is concerned, that I will briefly describe it. Unlike the bogs of the Lower Greensand, which are confined to the bottoms of the valleys, those of the Bagshot series, about Bisley Common, &c. (where the plant was found), are more terraced, extending, one above the other, for some little distance up the hill sides. Many of these bogs are denuded of the upper stratum of peat, together with the heather and other plants growing thereon. They thus present flat expanses of black peat-mud, covered, however, with a thin layer of white sand. On these sand-covered bogs scarcely any plant grows except the *Equisetum*, which is dotted about over the surface. The plant is well shown in the beautiful plate in Milde's monograph of the genus, and the Surrey specimens, though

scarcely mature, agree well with some of the figures. According to Milde, this species is very variable in the form of the stem. The Bisley plant has both barren and fertile stems nearly or quite simple when growing on the sand, but a few plants occur on the adjoining peat, and these show a much stronger tendency to branch. The occurrence of *Equisetum litorale* in this country is quite in accord with its continental distribution as given by Nyman.—W. H. Beeby.

NOTICES OF BOOKS.

The Illustrated Dictionary of Gardening; a Practical and Scientific Encyclopædia of Horticulture for Gardeners and Botanists. Edited by George Nicholson, of the Royal Botanic Gardens, Kew. Vol. ii. F—O. London: L. Upcott Gill, 170, Strand. 1886. 4to, pp. 544, 811 cuts.

If this work were only to be regarded as a "Dictionary of Gardening," we might content ourselves with repeating of the second volume what we said of the first (Journ. Bot. 1884, p. 254). It is useful and comprehensive; Mr. Nicholson continues to exercise a careful supervision of the contents; and the abbreviated titles of the works quoted are as irritating and unintelligible as they were when we previously took exception to them.

But there is one feature about the book which is in danger of being overlooked, for, although intended "for botanists," it does not directly appeal to them. We are accustomed to recognise in Miller's 'Gardeners' Dictionary' and Don's 'General System' works in which many species are described for the first time, and which therefore cannot be passed over by botanists; but Mr. Nicholson's Dictionary does not at first sight seem to stand on the same platform with these. Nor can it be considered of like importance: for, so far as we know, no new plants are described in it. But a little search will show that many species are here for the first time referred to their proper genera according to the 'Genera Plantarum'; and this book must therefore be cited by future authors for these names, for which Mr. Nicholson must stand sponsor. On looking through the volume we were convinced that this was the case, and Mr. Nicholson, in answer to our enquiry, kindly wrote as follows:—

"A good many plants are for the first time properly referred to correct genera in my gardening publication. *Isolepis gracilis* Hort. has been identified with *Scirpus riparius*. I do not think this had ever been done anywhere. Another instance which may be worth notice is *Isoloma bogotense*. This plant—founded on *Achimenes picta* Bot. Mag. 4126—is referred to *Isoloma* by 'Genera Plantarum'; specific name was preoccupied by *I. pictum* (*Gesnera picta*, Bot. Mag. 4431), so *I. bogotense* is first publication of name. *Odontoglossum vexillarium*, *O. Phalænopsis*, and *O. Roezlii* are put into *Miltonia* for

first time in any gardening work; they cross-fertilize with Miltonias, but refuse to mix with *Odontoglossum*, although Mr. Bentham states the opposite in Gen. Plant. *O. Warscewiczii* was awkward—there was already a *Miltonia Warscewiczii*, so I had to coin a name; and I used the specific name *Endresii*, in honour of the individual who first brought the plant alive to Europe."

Had the names in the Dictionary been printed in accordance with scientific practice, there would be little to complain of. But, no doubt from a quite intelligible consideration for the gardening public, no authority is appended to any of the names, so that (except in such rare exceptions as *Miltonia Endresii*, where the change of name is distinctly mentioned), it is impossible to tell whether a name has or has not been previously published. Thus we have "*Miltonia Roezli* (then follows description). . . . . B. M. 6065; B. O.* 30 (under name of *Odontoglossum Roezlii.*" This would lead us to suppose that the plant was figured as *O. Roezlii* in Bot. Mag., but it is there styled *Odontoglossum;* and (according to Mr. Nicholson's letter) its first publication as a *Miltonia* is found in the 'Illustrated Dictionary.' "*M. vexillaria* . . . . . B. M. 6037, under name of *Odontoglossum vexillarium*," makes the matter plain so far as Bot. Mag. is concerned, but there is nothing to show whether the plant has or has not been published elsewhere as a *Miltonia*.

Mr. Nicholson is too good a botanist and too careful a worker to wish to add to the troubles of synonymy; and we trust that in the remainder of the work he will insist on having the authority for each species placed after its name in the usual abbreviated form. This would take so little space that neither publisher nor gardener could complain, while the botanist would be as grateful as we fear he will now be the reverse. We might well spare some of the explanations of the specific names; in *Miltonia*, for example, the reader who learnt at p. 367 that *M. Clowesii Lamarcheana* would be called in English, "Mons. Oscar Lamarche de Rossius' Clowes' Miltonia," would probably remember that gentleman's name when, two pages further on, he came to another form named in his honour. Whether he or anyone else would ever use such a designation is another matter.

Unfortunately this is not the only difficulty. The volume is dated 1886, but most of the parts of which it is composed were issued during 1885. Thus an uncertainty of date is introduced, which may lead to further complications.

We have been thus particular in calling attention to these names because, as it seems to us, they cannot be ignored, though they are likely to be overlooked. In the latter case they will come forward at some later date, and further complicate the tangled skein of synonymy. It is better, therefore, to recognise at once as many as have claims to adoption.

---

* B. O. = Bateman's Monograph of *Odontoglossum*.

Phanerogamæ Cumingianæ Philippinarum; o Indice numèrico y Catálogo sistemático de las Plantas Fanerogamas coleccionadas en Filipinas por Hugh Cuming; con caracteristicas de algunas especies no descritas y del género Cumingia (Malváceas). Por D. Sebastian Vidal y Soler. Manila, 1885. 8vo, pp. 217. 1 plate.

This work begins with a Numerical Index of the Flowering Plants collected in the Philippines by Hugh Cuming in the years 1836–40, and must prove of considerable value to those who have sets of these.* No previous catalogue has appeared, though his numbers have been cited in various scattered monographs. The materials for the work, as the author tells us in his Introduction, were collected, principally at Kew, during the comparison in conjunction with myself of an extensive Philippine collection for the Forest Commission under his charge, and on behalf of the Spanish Government. A few subsequent additions were made at the British Museum and at Paris.

Following the enumeration is a list of the special localities in which the plants were collected, with the respective numbers belonging to each; and afterwards a systematic catalogue of the plants, with the numbers annexed. The arrangement followed is that of the 'Genera Plantarum,' except that the Gymnosperms are placed at the end of the Monocotyledons. The double enumeration, numerical and systematic, renders the finding of either name or number a very simple matter, and considerably enhances the value of the work. There is also a list of monographs and papers having reference to Philippine plants; and a Supplement, containing descriptions of many new species, an Index to the Systematic Catalogue, and, as an Appendix, a description and plate of a new genus of the Malvaceous sub-order *Bombaceæ*, appropriately called *Cumingia*,† having the habit and appearance of the Tropical Australian *Camptostemon*, to which it seems most allied. A list of corrections and Index of Contents completes the work.

As the work is privately printed, and may thus perhaps not be generally accessible, it may be worth while to enumerate those species appearing for the first time, giving Cuming's numbers in brackets. The following are fully described:—

Cumingia philippinensis, sp. unica, p. 212, tab. 1. (This was discovered by the author in Luzon, and is not represented in Cuming's collections).
Artabotrys Cumingianus, p. 169 (970).
Polyalthia lanceolata, p. 170 (450).
Orophea Cumingiana, p. 170 (854, 1412).
O. enterocarpoidea, p. 171 (1586).

---

* The author estimates that the flowering plants comprise 1332 species of 644 genera, as compared with 3466 species of 1002 genera known from the islands at the present time.

† The genus described by Don under this name is now reduced to *Conanthera* Ruiz. & Pav.

Rubus Rolfei, p. 171 (808).
Decaspermum Blancoi, p. 172 (801).
(*Myrtus communis* Blanco, non Linn.).
Eugenia (*Jambosa*) *cinnamomea*, p. 173 (846).
E. (*Syzygium**) *Cumingiana*, p. 173 (925).
Astronia Cumingiana, p. 174 (999).
A. Rolfei, p. 174 (1723).
Heptapleurum caudatum, p. 175 (800),
Nauclea Blancoi,† p. 175 (890).
N. Cumingiana,‡ p. 176 (833, 1522).
N. gracilis, p. 176 (835).
Uncaria florida, p. 176 (862, 898, 1504).
U. Hookeri, p. 177 (619, 1128).
Mussænda anisophylla, p. 178 (918).
Webera Cumingiana, p. 178 (865).
W. luzoniensis, p. 179 (1323).
Randia Cumingiana, p. 179 (1366).
Villaria § *littoralis*, p. 180 (874).
V. Rolfei, p. 180 (1271).
Canthium arboreum, p. 181 (776, 1544).
(*Ronabea arborea* Blanco).
C. Villarii, p. 182 (886, 1527).
Ixora Cumingiana, p. 183 (895, 1233, 1566).
Pavetta parvifolia, p. 183 (1394).
Lucinæa Cumingiana, p. 216 (1242).
(*Morinda Cumingiana*, p. 184. By error).
Gaultheria Cumingiana, p. 184 (934).
Jasminum luzoniense, p. 185 (1029).
Linociera Cumingiana, p. 185 (972).
Wrightia Candollei, p. 186 (1453).
Cordia Cumingiana, p. 187 (1012).
Callicarpa micrantha, p. 187 (1165).

The following transfers are here made, apparently for the first time :—

Gymnosporia philippinensis, p. 103 (1575).
(*Putterlickia? philippinensis* Planch.)‖
Allophylus Cobbe Bl., var. *grossedentata*, p. 105 (640).
(*Schmidelia grossedentata* Turcz.).

---

* This is not a *Syzygium*, but belongs to the section *Jambosa*.

† Identical with *N. purpurascens* Korth., from Java, Sumatra, and Borneo.

‡ Almost certainly identical with the Philippine *N. Bartlingii* DC. Prodr. iv. p. 344, though I have not seen an authentic specimen.

§ These two species were mentioned by me (Journ. Linn. Soc. xxi. 311) as probably forms of *V. philippinensis*. When I described the genus I had found no specimens at Kew, and only obtained a hasty glance at Cuming's specimens in the British Museum. When subsequently discovered at Kew, amongst the unarranged *Rubiaceæ*, I was convinced of their distinctness, but too late to correct the error.

‖ I have not succeeded in finding any publication of this, and believe it to be merely a manuscript name.

Lagerstræmia paniculata, p. 115 (1188).
(*Pterocalymna paniculata* Turcz.).
Ebermaiera Neesii, p. 34 (1083).
(*Ebermaiera spatulata* Nees, ex parte, non Hassk.).
Cyrtopodium ensiforme, p. 150 (2047, 2048).
(*Cyrtopera ensiforme* Lindl.).
(*C. squalidum*, p. 150 (2052, written "2053" by error).
(*Eulophia squalida* Lindl.).
Sarcochilus philippinensis, p. 150 (2114).
(*Camarotis philippinensis* Lindl.).
Hetæria tenuis, p. 151 (2109).
(*Rhamphidia tenuis* Lindl.).
Habenaria muricata, p. 151 (2086).
(*Dissorhynchium muricatum* Schauer).
Fimbristylis bursifolia, p. 156 (673).
(*Abildgaardia bursifolia* Steud.)*

The following transfers are anticipated in my Supplementary List of Philippine Plants, published in last year's issue of this Journal, pp. 209–16:—

Strombosia philippinensis.
Gomphandra laxiflora.
Cupania revoluta.
C. subundulata.
Connarus Rolfei Vidal,† p. 106 (851).
Terminalia mollis.
Barringtonia luzonensis.
Urophyllum memecyloides.
Symplocos oblongifolia.
Microchites Schrieckii.

A word of explanation as to the localities of Cuming's Philippine collections may not here seem out of place. I have failed to find any authentic list in Cuming's handwriting as to the localities visited by him, and the plants collected in each; nor is there, except in a very few instances, any locality written on the tickets in the sets I have examined. In the above work the list of localities has been chiefly compiled from two MS. lists in the Kew Library, and in a few cases from localities which have been written on the sheets. One of these is in Mr. Bentham's handwriting, and relates to the set possessed by him. It has been of great value in correcting some undoubted errors,—notably those which had led to plants from Malacca, Singapore, and Sumatra being accredited to the Philippines,—but the special localities are not given. The second list is partly in ink and partly in pencil, and some of the localities are evidently written in with hesitation. In the Kew Herbarium I find four original tickets, on which the locality is given as well as

---

* I find no such name, and, as a purse-leaved *Cyperacea* would be an anomaly, I suspect it must be a slip for *A. brevifolia* Steud. Syn. Cyp. p. 72, which is founded on Cuming 675. In this case it is synonymous with *F. acutifolia* Vahl, var. *minor* Nees.

† Founded on *Anisostemon trifoliolatus* Turcz., a plant which has been confounded with *C. polyanthus* Planch. I have already distinguished it as *C. trifoliolatus* (*l.c.*, p. 212).

the number. The writing is the same as that of the number-tickets which were distributed with the plants. Sir J. D. Hooker tells me he believes the writing on these original tickets to be that of Cuming's daughter, not of Cuming himself, as I at first suspected. These four tickets are as follows :—

Linociera luzonica F. Villar.—"1479, Island of Mindoro, Aug., 1838."
Premna nauseosa Blanco.—"693, Island of Corrigedor, Bay of Manila, Sept., 1839."
Potamogeton lucens L.—"1381, Prov. of Nueva Ecija, July, 1839."
Freycinetia luzonensis Presl.—"1455, Prov. of South Camarines, Feb., March, 1839."

According to the afore-named list the localities should be respectively—1 and 4, Prov. Batangas; 2, unlocalised; and 3, Prov. Albay. These provinces are districts of the Island of Luzon. As if to emphasise the fact that this list cannot be taken as correct, we note that the localities on these original tickets are scarcely represented in it, except among the Ferns, a set of which was purchased by Mr. John Smith in 1841, who at once published a list of determinations, with localities (Hook. Journ. Bot. iii. 392).

A possible explanation of this confusion may be that the locality-records for the ferns were published at once, from some source, which, not being then recorded in the case of the flowering-plants, is now lost. At any rate the locality written in some few cases on the sheet does not always tally with the list; for instance, 1688 (*Clerodendron* sp.), 1689 (*Bragantia* sp.), and 1724 (*Aporosa microcalyx* Hassk.) are cited in the list as from the Island of Samar; but on the sheets of the two former is written, "Island of Panay," and of the latter, "Island of Leyte." Again, several orchids on the sheets are recorded from the "Island of Bohol"; but no locality for any orchid occurs in the list. The discrepancy I cannot explain, except as above.

Enough has been said to show that the locality-lists, as given in the above work, must be taken *cum grano salis*, though not from any fault of Senor Vidal, who in his official capacity is doing excellent service to Philippine Botany, both in the investigation of the Flora and in the publication of the results. R. A. Rolfe.

New Books.—C. D. Härz, 'Landwirthschaftliche Samenkunde' (Berlin, Parey: 2 vols., pp. ix. 1362, 30 *m.*). — F. Hueppe, 'Die Formen der Bakterien' (Wiesbaden, Kriedel: 8vo, pp. viii. 152, 24 cuts). — J. Vallot, 'Guide du Botaniste dans la région de Cauterets' (Pau, Cazaux: 8vo, pp. xxviii. 331).—Mrs. C. P. Traill, 'Studies of Plant Life in Canada' (Ottawa, Woodburn: 8vo, pp. iii. ix. 288, tt. ix.). — E. M. Crookshank, 'Introduction to Practical Bacteriology' (London, Lewis: 8vo, pp. xxii. 249, tt. 30.

Articles in Journals.

American Naturalist (Jan.).—E. L. Sturtevant, 'A Study of the Dandelion.'

Bot. Centralblatt (Nos. 1–3). — A. Nathorst, 'Ueber die Bennung fossiler Dikotylenblatter.'

Botanical Gazette (Dec.). — J. C. Arthur, 'Some Botanical Laboratories of the United States.' — J. M. Coulter, 'Laboratory Appliances.' — Id., 'Laboratory Courses of Instruction.' — H. Ayres, 'The Laboratory at Strassburg.' — T. J. Burrill, 'Section Cutting.'

Bot. Notiser (Häft 6, 1885). — B. Lidforss, 'Några växtlokaler till nordvdestra Skånes flora.' — A. Rudberg, 'Nya växtlokaler i Vestergötland.' — B. Högretl, 'Ur femåriga anteckningar om blomningsföljd och några dermed i samnanhang stående iakttagelser.'

Bot. Zeitung (Dec. 18).—W. Belajeff, 'Antheridien und Spermatozoiden der heterosporen Lycopodiaceen.' — (Dec. 25). O. Lindt, 'Ueber die Umbildung der braunen Farbstoffkörper in *Neottia Nidus-avis* zu Chlorophyll.' — (Jan. 1, 8). H. de Vries, 'Ueber die Aggregation im Protoplasma von *Drosera rotundifolia*' (1 plate).

Bull. Soc. Bot. Belg. (Jan. 14). — J. C. Lecoyer, 'Monographie du genre *Thalictrum*' (concl.: 5 plates). — L. Piré & J. Cardot, 'Les Muscinées des environs de Spa.' — (Comptes rendus). E. Paque & V. Coomans, 'Les Mouvements des Pollinies chez les Orchidées.'—H. Christ, 'Nouveau Catalogue des *Carex* d'Europe.'* — F. Crépin, 'Reflexions sur les travaux de statistique végétale.' — Id., 'Sur le valeur que l'on peut accorder au mode d'évolution des sépales après l'anthère dans le genre *Rosa*.' — J. Cardot, 'Sur quelques Mousses de Belgique.' — E. De Wildeman, 'Contributions à l'étude des Algues de Belgique.' — A. Domet, Lichènes de Belgique.—E. Marchal, '*Bommerella*, nouveau genre de Pyrénomycètès.' —E. Laurent, 'Les Microbes boulangers.'

Bull. Soc. Bot. France (Jan. 1, xxxii.: Sess. extraord. à Charleville).—J. C. Richon, 'Sur quelques Sphériàcées nouvelles' (*Leptosphærites Lemoinii* (sp. fossile), *Lophiotricha* (n. gen.) *Viburni*, *Ophiobolus meliolæoides*, spp. nn.: 3 plates). — J. Cardot, 'Les Mousses des Ardennes.' — J. Constantin, 'Sur la structure des feuilles du *Nymphæa rubra* et du *Nuphar luteum*.' — L. Bazot, 'Herborisations dans les Ardennes Françaises.' — —. Boulay, 'De l'influence chimique du Sol sur la distribution des espèces végétales.' — P. Petit, 'Sur le développement des auxospores chez le *Cocconema cistula*' (1 plate).—F. Crépin, 'Sur l'inegalité de valeur des espèces dites linnéenes.'—E. Bescherelle, 'Mousses nouvelles de l'Amérique australe.'—P. Vuillemin, 'Sur l'anomalie du système sécréteur des *Hydrocotyle*.'

Bull. Torrey Bot. Club (Nov.).—W. Nylander, 'New N. American *Arthonia*.' — (Dec.). F. Wolbe, 'Fresh-water Algæ' (many new species: 1 plate). — 'The Origin of Herbaria.'

* See Journ. Bot. 1885, 260.

Gardeners' Chronicle (Jan. 2). — *Cœlogyne stellaris* Rchb. f., *Microstylis bella* Rchb. f., *Spathoglottis Augustorum* Rchb. f., *Eucomis zambesiaca* Baker, spp. nn.—G. S. Jenman, 'Proliferation in Ferns.' — (Jan. 9). *Oncidium lepturum* Rchb. f., sp. n. — J. M. Wood, '*Disa macrantha*.' — (Jan. 16). W. G. Smith, '*Craterellus cornucopioides* L. (figs. 11, 12).—*Schomburgkia inodora* Rchb. f., sp. n.—*Heritiera macrophylla* (fig. 16). — (Jan. 23). J. G. Baker, 'Cape Bulbs.' — 'Orchid Seed-vessels' (figs. 21–24). — T. W. Fulton, 'The Inflorescence, floral structure, and pollination of *Scrophularia aquatica* and *S. nodosa*.'

Journ. Linn. Soc. xxi. No. 140 (Jan. 25).—W. Joshua, 'Burmese *Desmidieæ*' (4 plates). — J. S. Gardner, 'Eocene Ferns from the Basalts of Ireland and Scotland' (1 plate).

Magyar Növénytani Lapok. (Dec.).—Acclimatisation experiments of the Archduke Joseph near Fiume, 1881–85.

Nuovo Giorn. Bot. Ital. (Jan. 4).—P. Pichi, 'Sulle glandule del *Bunius Erucago*' (1 plate). — A. Mori, 'Funghi di Modena.'— T. Caruel, 'Note di una corsa botanica nel Friuli.' — F. Morini, 'Sopra una nuova malattia del Frumento.'—A. N. Berlese, 'Sopra una specie di *Lophiostoma* mal conosciuta' (1 plate). — F. Cavara, 'Di alcune anomalie riscon:rate negli organi florali delle Lonicere' (3 plates).

Oesterr. Bot. Zeitschrift (Jan.). — A. Heinsch, Biography of Andreas Kornhuber (b. 1824: portrait). — A. Potter, 'Flora des bayerisch-böhmischen Waldgebirges.' — H. Sabransky, '*Rubus Pseudo-radula*.' — G. Schneider, 'Hieracien des Riesengebirges.'— E. Formánek, 'Flora des böhm.-mähr. Schneegebirges' (concl.).

Scottish Naturalist (Jan.).—J. W. H. Trail, 'Report on Fungi of East of Scotland.' — C. C. Babington, 'On Local Museums.' — J. Stirton, 'New Mosses from Scotland' (*Campylopus symplectus*, sp. n.). —J. Stevenson & J. W. H. Trail, 'Mycologia Scotica—Supplement.'

OBITUARY.

Dr. Henry Graves Bull, of Hereford.—Mycologists have read with deep regret of the death of this excellent and kind-hearted gentleman. Dr. Bull died in his sixty-seventh year, after a very brief and painful illness, on October 31st, 1885. As I was the first mycologist Dr. Bull ever spoke to or corresponded with, and as his last letters before he finally succumbed were addressed to me, the following notes may be of some interest in regard to his personal character and his mycological work. Personally Dr. Bull was one of the most genial, high-spirited, kind-hearted, hardworking men it is possible to conceive. He thought of everyone before himself. He was always gay, and enjoyed the droll side of all things. At his profession (a physician) and the study of fungi he worked night and day. I first met him in 1867; it was in Exhibition Road,

outside the Royal Horticultural Society's rooms. There was an exhibition of fungi that day, and Dr. Bull had come up from Hereford as a competitor with a large number of hampers of fungi. The hampers and light baskets had been piled high on the top of a four-wheeled cab, and Dr. Bull was keenly enjoying some playful banter with the cabman about the size, weight, and number of the hampers; the banter was as to whether the charge should be made for size, weight, or number. I made an amusing remark, and Dr. Bull at this immediately turned round and said, "Are you Mr. Worthington Smith?" Directly afterwards he was introduced to Mr. Berkeley, who was inside the building. At this meeting Dr. Bull was awarded (for the Woolhope Club) the first prize for his collection of named fungi. Dr. Bull had only at that time used Dr. Badham's volume and my coloured charts. Some of my drawings of fungi (now in the National Botanical Collection, British Museum) were at the above-mentioned exhibition, and with these Dr. Bull was delighted. The drawings spurred him on to making drawings of the Herefordshire fungi, a collection which must at this time be one of the most valuable in this country. Dr. Bull borrowed my drawings in families and genera, and these he studied not only as drawings, but side by side with the real plants. At first Dr. Bull was colour-blind as to green; he coloured all leaves black. At length he partially, but never I believe entirely, got over this colour difficulty. At the meeting above-mentioned Mr. Berkeley was advertised to address the audience, but just before the public were admitted he was taken suddeuly ill, and was obliged to go home. In this emergency, and to save serious disappointment, Dr. Bull, who was all vivacity and fun, volunteered to address the meeting on edible fungi. The room was packed, so that there was no standing room. Everyone expected a failure, as no one at that time had heard of Dr. Bull as a mycologist. With a smiling face Dr. Bull gaily ascended the platform with numerous actual specimens of fungi before him, and delivered an excellent address, full of humour, but scientifically accurate from beginning to end. He spoke for three-quarters of an hour, and never faltered or stopped. After the address I asked the Doctor how he had managed to get through the job in such a grand fashion. He replied it was as easy as possible, for he had just been getting Badham by heart in preparation for an address before the Woolhope Club, and all the fungus facts and names were clearly marshalled in order in his mind. Dr. Bull's successful *impromptu* lecture was in fact a rehearsal of a proposed Woolhope address. Dr. Bull never engaged in controversial subjects, and always seemed averse to express an opinion on any disputed points; he seldom contradicted or criticised, and was always ready to glean facts from any source, likely or unlikely. He was of course the very soul of the Woolhope Club: it is in fact impossible to imagine that Club without him. At the annual fungus meetings, held at Hereford for eighteen years, he was everything and everywhere, gallant and courteous to ladies, obliging, thoughtful, kind, and pleasant to everyone. His memory will be preserved as a man of science by his large and magnificent

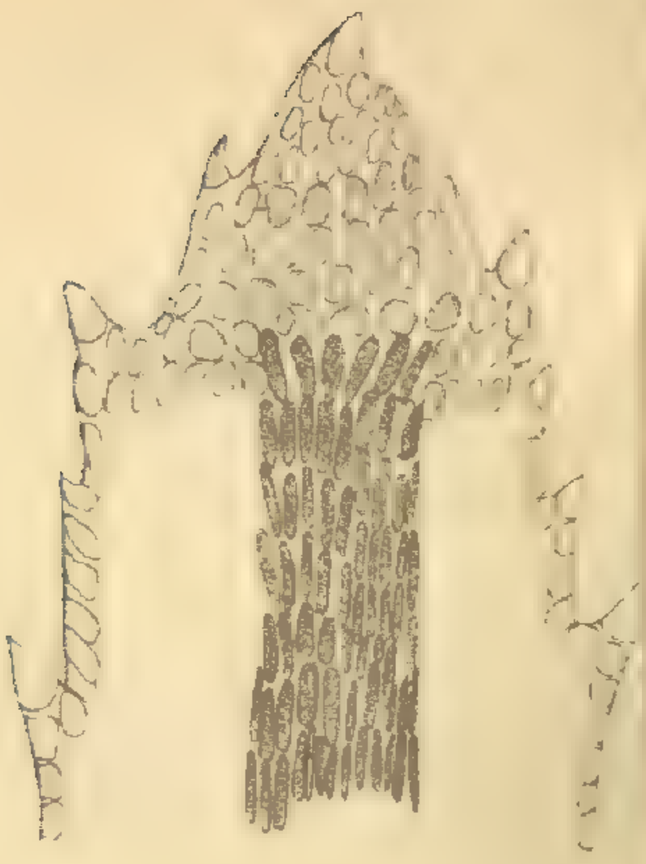
series of water-colour drawings illustrative of hymenomycetous fungi, some of which were engraved for the 'Transactions of the Woolhope Club,' and by the splendid volume called the 'Herefordshire Pomona,' the pages of which bear ample testimony to his varied and extensive knowledge, and the completion of which he happily lived to see. Some of the illustrations to this work are by his daughter, Miss Edith E. Bull, who has inherited her father's artistic skill. Dr. Bull's botanical career ranges over eighteen years. He was always very reticent in sending papers for painting or drawings for publication,* as he did not esteem his own abilities. The drawings are most extensive as regards number, and as coloured botanical works they have never been beaten. One day I asked him how it was all his drawings looked so extremely life-like and natural. He replied, with a gay laugh, "Don't you see, I never try to *improve* Nature, *but carefully copy all her accidents.*" All persons who have known Dr. Bull—who died in the month he loved—will keep him in pleasant memory till death, and no one will remember him more pleasantly and affectionately than the writer of these lines.—W. G. Smith.

In John Morris, who died on January 7th, within six months of completing his seventy-sixth year, English Geology lost its most eminent teacher. Distinguished chiefly as a palæontologist, his contributions to our knowledge of fossil plants entitle him to notice in these pages. While engaged in preparing his *magnum opus*, the 'Catalogue of British Fossils,' he, in 1839, published in the 'Magazine of Natural History' "A Systematic Catalogue of the Fossil Plants of Britain"; and in the 'Annals of Natural History' for 1841, "Remarks upon the Recent and Fossil *Cycadeæ*." He described the fossil plants in Prof. Prestwich's Memoir on the Coalbrook Dale Coal-field in the Geological Society's 'Transactions' for 1840 (vol. v.); and (having also described a fern from the Worcestershire Coal-measures in the Quarterly Journal of the Society for 1858) he communicated, in 1862, to the Geologists' Association—of which body he was for some years President—a paper upon Coal-plants. In the 'Popular Science Review' for 1876 he gave a full account of the Cretaceous Flora as described by Lesquereux; and, jointly with Dr. Thomas Oldham, contributed the Fossil Flora of the Rajmahal Hills to 'Palæontological India.' For twenty-two years (1855–1877) he was Professor of Geology at University College; and in 1878 received the honorary degree of M.A. from the University of Cambridge. A full memoir, with a portrait, appears in the 'Geological Magazine' for that year. Mr. Morris was buried at Kensal Green Cemetery on January 13th, in the presence of a small but representative group of his scientific friends.—G. S. Boulger.

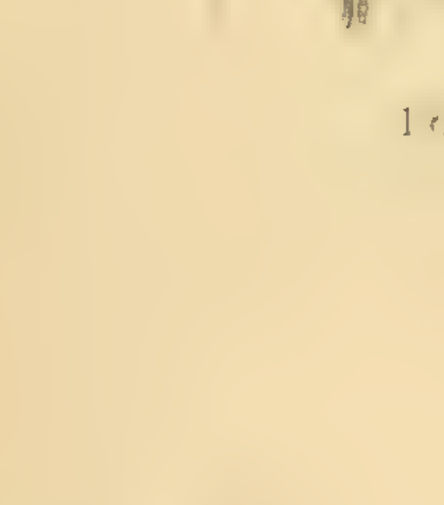
---

*[Most of his work appeared in the 'Transactions of the Woolhope Club,' from which his interesting paper on "The Mistletoe in Herefordshire" was reprinted, with corrections by the author, in this Journal for December, 1864. His only other contribution to our pages was a short paper on the occurrence of *Cortinarius russus* in Britain (Journ. Bot. 1870, 272).—Ed. Journ. Bot.]

1 a



2 a



B 2

2

B 1

1

A BRITISH MOSS NEW TO SCIENCE.

By G. A. Holt.*

(Tab. 265).

Thamnium angustifolium Holt, sp. n.—In habit resembling *T. alopecurum*, but less robust, the branches more slender, the foliage less complanate. Lower stem-leaves distant, squamose, more or less triangular. Middle stem-leaves sublinear, acuminate, concave, rather lax, erecto-patent, incurved; length 2·5 mm.; width at base ·65–·70 mm., at middle ·45–·50 mm. Margin plane, minutely serrulate below, sharply and coarsely serrate above. Nerve thick and very broad, but ill-defined, opaque, striate, gradually merging into the lamina; towards the base flattened and dilated so as to occupy almost the whole width of the leaf; narrowing upwards and becoming more prominent at back; vanishing below apex; width at base ·55–·60 mm., at middle ·33–·35 mm. Lamina at base very narrow, of 5–6 rows of elliptical cells. Areolæ oval, ·03 × ·01 mm.; at apex of leaf larger, ·035–·040 × ·010–·015 mm. Branch-leaves smaller, nerve narrower, about one-third width of leaf; teeth larger. Neither fruit nor flowers yet observed.

Habitat.—Found sparingly on shady limestone rocks, associated with *T. alopecurum*, in Ravensdale, Derbyshire, May, 1883 and 1884, G. A. Holt.

T. angustifolium is seen at once to differ from *T. alopecurum* in the narrow outline of the leaf,—always broadest at base,—in the very broad thick nerve, in the laxer areolation, and in the coarser serration. The leaves of *T. alopecurum* are ovate, being widest just above the base, the nerve comparatively narrow, ·1 mm. at base, subterete, well-defined, prominent throughout; the areolæ smaller, rounder, ·015 × ·010 mm. *T. angustifolium* has been confirmed as a new species by the eminent authorities, Prof. Lindberg and Dr. Kindberg.

Explanation of Plate. — *Thamnium angustifolium*. 1. Stem-leaf, × 27. 1 *a*. Apex of same, × 160. 2. Branch-leaf, × 27. 2 *a*. Apex of same, × 160. B. 1. Stem-leaf of *T. alopecurum*, × 27. B. 2. Branch-leaf of same, × 27.

PROF. F. PHILIPPI'S RESEARCHES IN CHILI.

By John Ball, F.R.S.

A recent letter from Professor Federigo Philippi, of Santiago de Chile, gives information which must interest many readers of this Journal. It is well known that the desert of Atacama, in the north of Chili, extending northward from the river of Copiapò through the mining districts of Chili and the territory recently acquired from Bolivia, is one of the most arid regions of the earth.

---

* Read at a Meeting of the Manchester Cryptogamic Society.

In ordinary seasons it is absolutely rainless, but at intervals of several years the region receives occasional showers, which suffice to maintain here and there some scanty vegetation, especially in the higher portions which extend to the watershed of the Andes. The Chilian province of Atacama includes, besides the desert strictly so called, a southern portion, lying between the rivers Copiapò and Huasco, which approaches nearly to the desert character. The average rainfall has been estimated at from two to four inches in the year, and the aspect of the country, excepting along the few streams descending from the Cordillera, is a waste, dotted at intervals by rare patches of perennial plants, chiefly shrubby *Compositæ*, or by species of the cactus family.

During the last winter, July and August, 1885, an extraordinary amount of rain fell in the northern part of Chili, and the rare opportunity was seized by Prof. F. Philippi to make a botanical excursion through the southern district of Atacama, between the rivers Copiapò and Huasco. He reached Caldera on the 19th September. After some days spent in the neighbourhood of Copiapò, he went by railway to Chañarcillo, and starting from that place rode across the Travesia to Carrizal Alto. The Travesia is a wide plain lying amidst the hills, about 18 leagues in length by from 6 to 8 in width, which in ordinary times is absolutely bare. Prof. Philippi describes the appearance of the country as that of a flower-garden. "The whole ground" he says "was covered with flowers of the most different classes, most of them annuals, some perennials, but low and lying on the ground, and very few shrubs." No trees were seen, and the only tall plants were the *Cereus* (doubtless *C. Quisco*), which here, as in Central Chili, prefers the northern sunny slopes of the hills.

After some days near Carrizal Alto, and visiting the course of a stream descending from the Cordillera, Prof. Philippi crossed another plain, similar in character to the Travesia, leading to Vallerar in the valley of the Huasco; thence he descended that valley to Freirina and Huasco, embarking at the latter place to return to Valparaiso on the 4th of October.

Professor Philippi has been good enough to send me a summary of the results of his first examination of the collections made during this excursion of only fourteen days. Besides three ferns he enumerates 285 species of phanerogams, of which he reckons 74, or more than one-fourth, as new to science. The following are the natural orders most largely represented, amongst which it will be seen that the proportion of *Compositæ* is much smaller, and that of *Leguminosæ* much larger, than is ordinarily found in the adjoining regions of Chili and Peru.

Compositæ	36	species.
Leguminosæ	33	,,
Borragineæ	25	,,
Portulaceæ	21	,,
Convolvulaceæ (including *Nolanaceæ*)	18	,,
Solanaceæ	13	,,
Gramineæ	11	,,

The residents of this district unanimously declared that no such abundant vegetation had been seen for many years; and the experience of other botanists who have visited the district explored, which did not extend to the flanks of the Cordillera, would not lead us to expect the possibility of collecting one-half of the number of species found last year.

Especial interest attaches to the annuals that appear to form the larger portion of Prof. Philippi's collection. It is conceivable that in a climate so dry, seeds lying on the surface may preserve their vitality for many years, and may produce a fresh generation when a rainy season arrives; but the enquiry as to the probable origin of each of these species will offer many curious subjects for investigation. For such an enquiry we must await the publication of the full results of Prof. Philippi's excursion.

RECENT ADDITIONS TO THE FLORA OF ICELAND.*

By Arthur Bennett, F.L.S.

Since the publication of Groenlund's 'Island Flora' (1881), the author has noticed the additions in 'Karakterisk af Plantevæxter paa Island, 1884,' and in 'Afsluttende bidrag til oplysning om Islands Flora.' In 1884, Strömfelt, in 'Ofver af Kong. Vet. Ak. Förh. No. 8, Stockholm,' contributed a paper entitled, "Islands Kärlväxter, Vetraktade från växtgeografish och floristish synpunkt." In these papers some thirty species are added. The following list includes all these additions, but some were admitted by the older authors, and also by Prof. Babington, in his "Revision," in Journ. Linn. Soc. ii. (1871). From this it is evident that Groenlund was over-cautious in his 'Flora'; still this is a fault on the right side, and calls attention to those species that want carefully searching for. Groenlund in his first-named paper gives much interesting matter on Icelandic Botany: A list of the natural orders occurring in Iceland, comparing them with Greenland, the Faroes, Denmark, and Scandinavia; Notes on the first flowering of representative species; Lists of plants found near Reykjavik (about 64° 10′ N. lat.), in the south-west of the island, and near Myvatn (about 65° 30′ N. lat.), in the north-west of the island, in parallel columns; the former consisting of 194 species, the latter of 174 species.

Of the 194 (Reykjavik) 120 occur near Myvatn, and of the 174 (Myvatn) 121 are found near Reykjavik. Lists of species found north of 65°, and of those south of 65°, with many other lists of much interest. He completes his paper with a few remarks on the origin of the Flora, with reference to Sir J. D. Hooker's and Prof. A. Blytt's writings on Insular Floras. Accompanying the paper is a good map.

---

* References to Icelandic Botany will be found in this Journal for 1866, p. 94; 1867, p. 107; 1870, pp. 235 and 277; 1875, p. 210; and 1882, p. 60.

An interesting part of Strömfelt's paper is a comparison of 493 species that occur in Scandinavia, the Faroes, Iceland, and Greenland. Of these 402 occur in Scandinavia, 218 in the Faroes, 349 in Iceland, and 367 in Greenland. 137 species are common to all four countries, and of these only 9 do not occur in Scotland, *i. e.*, *Cerastium arcticum* Lange (not quite certain for the Faroes, and perhaps Scotch), *Draba hirta* L., *Arabis alpina* L., *Papaver nudicaule* L., *Ranunculus glacialis* L., *Angelica Archangelica* L., *Armeria elongata* Koch, *Kœnigia islandica* L., and *Carex filipendula* Drej.

Strömfelt now makes the Icelandic Phanerogams and Filices to consist of 371 species. Babington numbers 467; of these he expresses or implies doubt of some 30, and, with a few others mentioned in only one list, we may call his number for the Flora 430 species. Looking at the distribution of these 60 species which constitute the difference between these estimates, outside Iceland, and especially their northern limits in Scandinavia (in this case not all a question of latitude so much as of local conditions and climate), I believe the Icelandic Flora ere many years have passed will be found to number some 410 species actually represented by specimens in Herbaria. In this I exclude subspecies of *Hieracium*, which will probably be found to be much more numerous there than at present known. I have altered the sequence of the species to that usually adopted in British books.

Ranunculus acris L., var. *borealis* Trautv.; f. *grandiflora* Trautv. Eskifjörthur.

Draba nivalis Liljeb., f. *speluncarum* (n. f.) Strömf.—East side of Myvatn.

Stellaria crassifolia Ehrh., β. *subalpina* Hn.; γ. *luxurians* Strömf. Akureyri (N. Iceland).

Drosera rotundifolia L., f. *pygmæa* Groen. Nanthóll and Fossvogur, near Reykjavik (Thoroddsen).

Stellaria humifusa Rottb. Hofsós, by Skagafjörthur (N. Iceland). Described from Icelandic specimens by Rotteboll, but persistently ignored by nearly every writer, except Gliemann and Vahl; this is given as new by Strömfelt.

Alsine stricta Whlb. Akureyri; Ljósvatn, and three other stations. Known to Groenlund in his Flora by a single specimen only, gathered by Steenstrup.

Sagina nivalis Lindbl. By Skithadalur, Vathlakeithi (N. Iceland).

Pisum arvense L. Eyaarbakhi (S. Iceland). "Plant not cultivated."

Medicago lupulina L. Reykjavik (S. Iceland) (Thoroddsen). Babington says there is a specimen in Solander's collection, but doubts its being native.*

Vicia sativa L. Outside Reykjavik (S. Iceland). "Surely introduced."

---

* [This seems a good opportunity for saying that the specimen on the faith of which *M. lupulina* is included in Prof. Babington's 'Revision' is not that plant, but *Trifolium minus* Sm. This is apparently an addition to the list.—Ed. Journ. Bot.]

Alchemilla conjuncta Bab. Strömfelt remarks on this, "In all the places I visited, from the coast to the west of (the) Lagarfljot. According to an example from the Faroes, kindly given to me by Mr. E. Rostrup, of Copenhagen, it perfectly agrees with the *A. fissa* Sch. described in the 'Faroen Flora,' which name is given to a plant occurring in the mountain ranges of Mid and South Europe. Compare the description in 'Faroen Flora,' pp. 30–31 (*A. fissa*) and Babington's 'Manual,' ed. 4, p. 92 (*A. conjuncta*), with 'Flora of Silesia,' Wimmer, 1841 (*A. fissa*), and 'Flora of France,' Grenier and Godron, 1848, vol. i., p. 565 (*A. pyrenaica*)," p. 113. I am also indebted to Mr. Rostrup for specimens of his 'Faroen Flora' plant, and I do not think they are *A. conjuncta;* in this view I am supported by Dr. Lange, of Copenhagen, who remarks in a letter, "*A. conjuncta* seems a variety of *alpina; A. fissa* seems different." I have not seen the Icelandic plant.

Epilobium lactiflorum Hausskn. "An example gathered by Thoroddsen in 1884, from 'Store Gjá,' Prof. Lange has determined as the above-named species. Haussknecht, in his Monograph of the genus *Epilobium*, 1884, gives it as found in Sweden, Norway, Greenland, Kamschatka, Labrador, and Iceland, whence he has seen an example gathered by Steenstrup at Gaspodal." I suppose this to mean Garpodalr, in the north-west of the island.

Callitriche autumnalis L. Federssen in Med. den Bot. Foren. (1885), p. 159. Not admitted by Groenlund. Babington remarks, "Included in all the lists. I know of no localities."

Imperatoria Ostruthium L. Vithey (H. Fridriksson).

Hydrocotyle vulgaris L. Was found by Thoroddsen in a warm spring at Langarvath, by Andakilsá, the temperature of which was 48° C.

Bellis perennis L. Skagafjörthr (H. Fridriksson). Eyafjörthr (J. Mortensen). Babington records this as from Symington; "given to him." Groenlund says, "New for Iceland."

Achillea Ptarmica L. Obfussá, near Langardælir (S. Iceland), (G. Gudmundsson). Babington remarks, "Solander also saw *A. Ptarmica* in Paulsen's herbarium; and Hornemann likewise records it," but he does not admit it.

Gnaphalium sylvaticum L. By a warm spring near Langar, against Athalreykjadalur (N. Iceland). *Cf.* Babington's 'Revision,' p. 313.

(*? Erigeron uniflorus* L. Herdubreidarlindir (Thoroddsen). Some doubt).

Hieracium nigrescens Willd. Eskifjörthur (E. Iceland). — *H. Schmidtii* Tausch. Bildudabur, near Arnarfjörthur (W. Iceland).— *H. murorum* L. Under this Strömfelt gives four subspecies: 1. *basifolium* v. *alpestre* Lange (S. and N. Iceland; 2. *bifidum* Rit. (N. Iceland); 3. *Sommerfeltii* Ldg., var. (N. and E. Iceland); 4. *Sommerfeltii*, near this (E. Iceland). — *H. dovrense* Fr., var. *demissum* Strömf. Asgantrsathir, east of Eyrarbakhi (S. Iceland).

Pyrola rotundifolia L. Eyafjörthur, by a warm spring (H. Fridriksson). Confounded with *media* by some of the early writers on the Flora ?.—*P. uniflora* L. Reynistathir (H. Fridriksson).

? [*Ajuga pyramidalis* L. Doubtful specimen found.]

As stated by Dr. Trimen (Journ. Bot. 1870, 279), there is a specimen of *Veronica Anagallis* L., localised "Islandia in thermis" in Herb. Mus. Brit., collected by Banks and Solander. Babington says he has seen no specimens, and doubts it. Groenlund does not admit it. In Sweden it occurs north to "Gefleborgs län" and South Norway.

Glaux maritima L. Leirárey (H. Fridriksson). Given by Baring-Gould for "Eyjaford and Mithfjord," and numbered by Babington.

Plantago major L., v. *rotundifolia* Lange. Reykir, at Mossfell (Thoroddsen).

? Urtica dioica L. Reykjavik (H. Fridriksson). Numbered by Babington.

Salix glauca L.; *pullata* Fr. Eskifjörthur (E. Iceland). — *S. lanata* × *herbacea* Lundstr. (n. h.) — *α. pubescens*. Vathatheithi (N. Iceland).—*β. glabrata*. Hallounstatharháls (E. Iceland).

Potamogeton polygonifolius Pour. Federsson in Med. den Bot. Foren, p. 159 (1885).—*P. natans* L. Near Eyrarbakhi (S. Iceland). Near Akureyri (N. Iceland). There is a specimen from Iceland in Herb. Mus. Brit.

Zannichelia polycarpa Nolte. Federsson in Med. den Bot. Foren, p. 159 (1885).

Sparganium natans L. Federsson, *l. c.* Babington remarks, "It is in Solander's collection." — *S. affine* Schweizl. Near Eryarbakki (S. Iceland). Myvatn (N. Iceland).

Listera ovata L. Omitted by Groenlund; but there is a specimen in Herb. Kew from Paulsen (*fide* Hemsley in 'Botany of "Challenger"').

Luzula maxima DC. Havebrugscand (J. Mortensen).

Carex incurva Light., subsp. *brevirostris* Cederstr. On the sandy strand of the Lagarfljóts, between Vallenes and Hallounstathur (E. Iceland). A rare form, known before only for N. Norway, placed by Nyman under subsp. *C. Deinbolliana* of Gay. — *C. glareosa* Wg. Setythisfjördur. Seley, outside Reytharfjörthur (E. Iceland). Grimsey (Thoroddsen). Hofsós, near Skagafjörthur. Oddeyri (N. Iceland). Not noticed by Groenlund or Babington, but given for "Island" by Dr. Lange in his Conspectus Fl. Grœnlandicæ; probably on the authority of Drejer, who, in his 'Revisio,' p. 443, gives it for Iceland, as given by 'Schkur Hand.,' 4, p. 114. Cross-naming has occurred with this: *C. Heleonastes*, *C. lagopina*, and *C. rufina*, v. Floras of Spitzbergen. — *C. filipendula* Drej., var. *latifolia* Strömf. Reykjavik (S. Iceland). "Seems like *γ. concolor* Drej., *cf.* Fl. Dan. t. 2372." A robust form with broad leaves.—*C. acuta* L. From Stokkseyri towards the north to Hraungerthi (S. Iceland). This is not given in many of the northern Floras (Norrlin, &c.), but Mr. Bailey, of Cambridge, U.S.A., gives it for Greenland in his 'List of the North American Carices'; but I do not know on what authority, as Dr. Lange does not accept it. It may be that Mr. Bailey's plant represents the *C. cæspitosa* v. *grœnlandica* Lange of Berlins' 'List of Greenland Plants gathered by

the Swedish Expedition of 1883.' Lindsey gives "*acuta*" for Iceland, with five other authors who have written on its Flora.

Glyceria maritima Wahlb. Common near Skagafjörthur and Eyjafjörthur (N. Iceland). Babington remarks, "In all the lists," but Groenlund did not admit it in his 'Flora.'—*G. arctica* Hooker, *β. laxa* Lange. Myvatn (N. Iceland). An interesting addition of a high Arctic species of Greenland, N. America, Nova Zembla, and Spitzbergen; but seemingly not Asiatic, at least it does not appear in Kjellman's 'Report on the Vega Expedition,' &c.

Poa alpina L., v. *minor*. Myvatn (Lundgren). Hédinshöfthi, in Nœrheder of Húsarik (Thoroddsen). — *P. pratensis* L., v. *alpigena* Blytt. Gæsavatn (Thoroddsen).

Ophioglossum vulgatum L., v. *minor* Moore. Found by Thoroddsen in 1882 near Bjarnarflag, east of Myvatn (N. Iceland); also in 1883 at Gunnutrver by Reykjanes, when the sand was 27° C.

In his recently published 'Additamenta ad Consp. Fl. Europ.,' Dr. Roth (to whom I am indebted for the localities) gives the following species as Icelandic:—

Callitriche hamulata Kütz. Anilthrasser, 1, 8, 1856, by Haurdiger in Herb. A. Braun.

Myosotis alpestris K. Island, by Haudiger in Herb. A. Braun.

Rumex crispus L. Island, 1881, by Sinogowitz in herb. Berlin.

Salix Lapponum L. Island, 1881, by Sinogowitz in herb. Berlin. Dyrafjord, N.W. coast, by Wendil (1881) in herb. Berlin.

Koeleria cristata L. Dyrafjord, N.W. coast, by Wendil (1881) in herb. Berlin.

ON THE RELATION OF THE BRITISH FORMS OF RUBI TO THE CONTINENTAL TYPES.

By J. G. Baker, F.R.S.

(Concluded from p. 47.)

Following the sequence of Nyman, the present paper includes the Corylifolii, in addition to all the Glandulose groups.

Group 6.—Adenophori.

This group, the account of which occupies from p. 247 to p. 284 in Koch's 'Synopsis,' is altogether omitted by Nyman. A few of the forms included therein by Focke are mentioned, however, under other groups by Nyman.

R. egregius Focke Synops. p. 253.—Dr. Focke refers to this doubtfully a Cumbrian bramble nearly allied to *R. infestus*, and has sent me for comparison an authentic specimen of the German plant. A form very near to this is not infrequent in North Yorkshire, and *R. Purchasii* Bloxam is also nearly allied; as is also a Hertfortshire bramble, which my friend Mr. H. T. Mennell has just shown me, which Dr. Focke has referred doubtfully to *R. Schlickumi* Wirtg.

R. infestus W. & N. Rubi Germ. t. 30.—In his 'Synopsis' (p. 272) Focke admits our British *infestus* as identical with the German plant, and he has lately confirmed what I sent him under this name from three different localities in Surrey. His specimens from Minden (Focke Rubi selecti exsiccati, No. 66) entirely confirm this idea. The same form is not infrequent both in North Yorkshire and the Lake district. *R. infestus* appears to bear pretty much the same relation to *Koehleri* that *Hystrix* bears to *rosaceus*. The Scandinavian *R. tæniarum* Lindeb. seems nearly allied to *infestus*.

R. badius Focke Synops. p. 276. — Under this Dr. Focke cites doubtfully *R. fuscoater* of Babington. I know nothing whatever of the German plant, so called. As I understand *R. fuscoater* Bab., it comes in between *Radula* and *villicaulis* var. *adscitus*. This and the two preceding are omitted in Nyman.

Group 7.—Vestiti.

Of this group, as it stands in Focke and Nyman, *R. vestitus* (*leucostachys*) and *pyramidalis* Kalten. have been already noticed in my last paper.

26. *R. obscurus* Kaltenb. — I collected this in the neighourhood of Spa, but have not seen anything exactly like it in England. *R. adornatus* and *exsecatus* of Muller, both cited by Babington under the English *foliosus*, are placed here by Focke, but the former is altogether omitted by Nyman. I do not know much about the English *foliosus*, but feel satisfied this is a far better position for it in the series than where it stands in Nyman.

27. *R. Lejeunii* W. & N. Rubi Germ. t. 31. — Here Dr. Focke rejects the English plant, so called. I failed to find the type in the neighbourhood of Spa, but gathered *R. festivus* Muller, placed by Nyman as a subordinate form of it. The Spa *festivus* closely resembles the Plymouth "*Lejeunii*" gathered by Mr. Briggs in its barren stem and leaf, but the panicle of the Devon plant is much more aciculate and setose.

Group 8.—Radulæ.

28. *R. Radula* W. & N. Rubi Germ. t. 39.—About this all recent authors seem to be agreed. It is one of the commonest and best-marked British types, and extends on the Continent from Scandinavia to France and Austria. Focke and Genevier both accept our ordinary British plant, so-called, as identical with what they call by the same name. Both of them agree in rejecting our English "*rudis*" as identical with the German plant. Nyman and Focke place it as a subordinate form of *Radula* under Lindley's name, "*echinatus*." It seems to me to differ mainly from the type *Radula* in the deeper dentation of the leaf. I do not think *R. Leightoni* Lees can stand where Nyman has placed it under *R. rudis*. It seems to be a subordinate form of *Radula*, differing from the type by its subequal prickles. *R. mutabilis* Genevier, not noticed by Nyman, seems to be a well-marked form of this affinity.

29. *R. rudis* W. & N. Rubi Germ. t. 40 (*R. Lohrii* Wirtg.).—Dr.

Focke has kindly sent me a specimen of the German typə, which is totally different from the plant to which we have been applying the name, and looks also totally different from *R. Leightoni* Lees. Dr. Focke has recently identified with the German *rudis* a Surrey plant gathered by Mr. Beeby. See also Prof. Babington's remarks on *R. Lohrii* Wirtg. ('British Rubi,' p. 186).

30*. *R. saltuum* Focke (1870) = *R. Guntheri* Bab., non W. & N. = *R. flexuosus* P. J. Mull. & Lefev. in Jahresb. der Pollichia, vol. xvi. p. 240 (1859).—This is evidently quite identical with what we have been calling *Guntheri* in Britain, the true *Guntheri* being a more intensely glandulose type, placed by Nyman as a subordinate form of *hirtus*. I have four good specimens of genuine *Guntheri* from Silesia, two sent by Dr. Focke and two by Dr. F. W. Areschong, and they quite agree with one another, and differ materially from anything I have seen in Britain. Of *R. saltuum* I have specimens, so called, from Oldenburg, Schaffhausen, and Geneva, and exactly the same plant from Central France, labelled by Genevier as *R. flexuosus* of Muller and Lefevre, of which there is a very full description in the 'Pollichia,' as just cited, and which is an earlier name than *saltuum*.

32. *R. thyrsiflorus* W. & N. Rubi Germ. t. 341.—Dr. Focke has identified for me as *thyrsiflorus* a fine woodland bramble which I gathered on the Siebengebirge, and another collected near Spa. I have not seen in England anything that agrees with these. *R. Babingtonii* and *Bloxami* are classified as subordinate forms of *thyrsiflorus* by Nyman, but, taking the specimens just alluded to as a standard, they both differ from it appreciably. I have not seen anything from France or Germany that matches either of them. The continental types with which *Bloxami* should be compared are *rhenanus* and *Billotii* Muller, *squalidus* Genevier, and *anisacanthos* Braun.

33. *R. pallidus* W. & N. Rubi Germ. t. 39 = *R. obliquus* Wirtg. — Nyman does not admit this as British, and Dr. Focke considers the British plant, so called, to be a subordinate form of *R. Koehleri*. He has kindly sent me a specimen of the German type, which has much more regular prickles than what we have so called.

33*. *R. fuscus* W. & N. Rubi Germ. t. 27. — This I collected both in the neighbourhood of Spa and near Heidelberg. It is closely allied to the last. The plant of the Midland Counties and Cheshire (the latter collected by Mr. Warren) which was distributed under the name of *fuscus* by Bloxam requries further study, but I know too little about it to offer any opinion with confidence. The plant I mean is that from Great Cowleigh Park, mentioned by Babington under *hirtus* at p. 251 of 'British Rubi.'

R. longithyrsiger Lees MSS. = *R. pyramidalis* Bab., non Kaltenbach. — So far as present knowledge goes, this is an endemic British form, belonging to Watson's Atlantic type of distribution. I have seen it growing plentifully both in Devonshire and Wales, but nowhere in the east or north of England.

Group 9.—Hystrices.

35. *R. rosaceus* W. & N. Rubi Germ. t. 36 = *R. aculeatissimus* Kalten. — Here Dr. Focke admits the identity of the German type with the British and Irish plant, so called. I did not meet with it either in Belgium or Germany.

35*. *R. Hystrix* W. & N. Rubi Germ. t. 41.—This is not given as British, either by Focke or Nyman, but Dr. Focke has recently admitted the identity of the German type with the rare London bramble, so called.

36*. *R. Koehleri* W. & N. Rubi Germ. t. 25.—This is not admitted as British either by Focke or Nyman, but Dr. Focke admits as identical with the German type the plant so abundant in the west of Surrey (Virginia Water, Chobham Common, St. Ann's Hill), which we have always called by this name. I gathered it this autumn both in Germany and Belgium. He regards as a shade form of *Koehleri* what we have been all along calling *pallidus* in England, which is our commonest woodland glandulose type. This comes near the German *R. apricus* Wimmer, but the latter has clasping fruit-sepals. I gathered a form very near the English *pallidus* this autumn in the woods of the Siebengebirge.

Group 10.—Glandulosi.

38. *R. Schleichleri* W. & N. Rubi Germ. t. 23. — We have had this in cultivation for many years at Kew, but I never saw anything like it in Britain. It appears an essentially ternate type, most like *Koehleri*, but with long-trailing barren stems. Focke and Nyman classify *R. humifusus* W. & N. as a subordinate form under *Schleichleri*.

39. *R. serpens* Weihe, non Godr.—This is the common bramble of the shaded woods round about Heidelberg. Its alliance is close with *R. hirtus*.

40. *R. hirtus* Waldst. & Kit. Plant. Hung. t. 141 (not 114, as misprinted in Focke); W. & N. Rubi Germ. t. 43. — This is best known to London botanists as one of the brambles of Putney Heath. As treated in Nyman, it covers a wide range of forms. A very large number of the forms named and distributed by Boulay and Muller would fall in here. My difficulty is to draw the line between this and *Bellardi* on the one hand, and on the other between this and *rosaceus*. My Yorkshire plant, referred by Babington to *humifusus*, appears to be *R. saxicolus* Muller, and to range here, as does also the Silesian *R. Guntheri* W. & N. I had an opportunity this autumn of gathering characteristic *hirtus* in excellent condition on the thickly-wooded slopes ascending from the Castle at Heidelburg to the Konigstuhl.

42. *R. Bellardi* W. & N. Rubi Germ. t. 44.—Focke and Nyman admit the identity of the German type with our rare English bramble so named, which is well figured in Eng. Bot. t. 2883. It is a frequent woodland bramble of France and Germany. I saw it in plenty this autumn in the woods of the Siebengebirge. *R.*

eglandulosus, as the name stands in Nyman, is no doubt an unfortunate misprint. The two older names, *R. hybridus* Vill. Delph. Hist. vol. iii. p. 559 (1789), and *R. glandulosus* Bellardi, Act. Taur. v. 230 (1792), are both defined very vaguely, and probably include all these glandulose forms.

Group 11.—Corylifolii.

48. *R. corylifolius* Smith.—Our ordinary *corylifolius* seems to be quite as common in France, Germany, and Belgium, as in Britain. I do not think anyone in Britain would be inclined to follow Nyman in keeping up *R. Wahlbergii* Arrh. as a distinct primary type. In Blytt's 'Norges Flora,' vol. iii. p. 1167, Dr. Areschoug keeps up the name *R. maximus* Linn. Westgotharesan, p. 113, citing under it Svensk. Bot. t. 187, Fl. Dan. t. 2538, and Fries, Herb. Norm. fasc. vii. No. 48. All these would be referred to *corylifolius* by a British botanist. If the name *maximus* be admitted, of course it has long priority over *corylifolius*; but the book is a few years prior to the first edition of 'Species Plantarum,' and so, I think, it cannot be reckoned as a binomial name. *R. incurvatus* Bab., arranged here by Nyman, is clearly quite out of place. A large number of Muller's species range here (see Babington's 'British Rubi.' p. 272), and, judging from the very poor figure, I should suppose *R. nemorosus* of Hayne to be a form of *corylifolius*.

49*. *R. horridus* C. F. Schultz, Fl. Starg. Suppl. p. 30 (1819); DC. Prodr. vol. ii. p. 562 = *R. ferox* Weihe in Bonng. Prodr.; Fl. Monast. p. 153 (1824) = *R. dumetorum* var. *ferox* W. & N. Rubi Germ. t. 45 B. Here I should classify the series of forms treated so fully by Mr. Warren in Journ. Bot. vol. viii. p. 149 (1870), under the name of *dumetorum*. Dr. Focke says that the *dumetorum* of Weihe and Nees was understood by them to include both this and the last, but this is Nyman's plant, so called. *R. horridus* is an earlier name, and the plant is fully defined. Here range *R. diversifolius* and *tuberculatus* of Babington, and the British forms which have been referred by Focke to *R. oreogeton* and *myriacanthus*. Var. *concinnus* Warren, which is one of the commonest Rubi about Thirk and Matlock, is clearly identical with *R. tenuiarmatus* Lees. I gathered a curious form in the neighbourhood of Spa with a very leafy panicle, and sepals adpressed to the fruit. *R. Briggsii* and *R. Bagnallii* Blox. connect this with the Glandulosi.

50. *R. cæsius* Linn. — This seems to be quite as common in Germany, France, and Belgium as in Britain, and we have always used the name in the same sense as that in which it is employed by Nyman.

Summary. — As far as I am able to understand the matter, the following is the position in which we stand in Britain in regard to the bramble types of Weihe and Nees, as interpreted by Focke and Nyman:—

1. *German types admitted as identical with British types for which we have been using the same names*:—plicatus, rhamnifolius, villi-

caulis, macrophyllus, Sprengelii, leucostachys (vestitus), infestus, Radula, Koehleri, rosaceus, hystrix, hirtus, Bellardi.

2. *British types for which we in Britain have been using the names of the 'Rubi Germanici' in a wrong sense*:—affinis, cordifolius, carpinifolius, discolor, Grabowskii, thyrsoideus (fruticosus), Lejeunii, foliosus, rudis, fuscoater, scaber, pallidus, Guntheri, humifusus.

3. *Types of the 'Rubi Germanici, with which British plants need further comparison*:—carpinifolius, vulgaris, silvaticus, rudis, fuscus.

The following is an attempt to readjust the list of British forms, as classified on the plan of Hooker's 'Student's Flora,' after working through them again this year, with the aid of Focke's 'Synopsis' and Nyman's 'Conspectus,' and with the help in classifying and communicating specimens which Dr. Focke has kindly given:—

1. *Rubus Idæus* Linn.
   ,, *obtusifolius* Willd. (*Leesii* Bab.).
2. ,, *suberectus* Anders. (*nessensis* Hall.).
   ,, *fissus* Lindl.
   ,, *plicatus* W. & N.
   ,, *nitidus* W. & N.
3. ,, *rhamnifolius* W. & N.
   ,, *Maasii* Focke (*cordifolius* Bab., non W. & N.).
   ,, *montanus* Wirtg. (*affinis* Bab., non W. & N.), (to be compared with *carpinifolius* W. & N. and *senticosus* Koehl.).
   ,, *incurvatus* Bab.
   ,, *imbricatus* Hort.
   ,, *ramosus* Blox. (to be compared with *R. vulgaris* W. & N.).
4. ,, *Lindleianus* Lees.
5. ,, *corylifolius* Sm. (*maximus* Linn. Iter Westrog.).
   ,, *conjungens* Bab.
   ,, *Wahlbergii* Arrh.
   ,, *degener* Genev.
   ,, *Balfourianus* Blox.
   ,, *altheifolius* Bab. an Host?
   ,, *latifolius* Bab.
6. ,, *cæsius* Linn.
   ,, *tenuis* Salter.
   ,, *ulmifolius* Bab.
   ,, *intermedius* Bab.
   ,, *pseudo-idæus* Lejeune.
7. ,, *thyrsoideus* Wimm.
8. ,, *ulmifolius* Schott (*discolor* Bab., non W. & N.).
   ,, *abruptus* Lindl.
   ,, *Linkianus* Guss. (*pubescens* Bab.).
9. ,, *pubescens* W. & N.
   ,, *horridicaulis* Muller? (*Grabowskii* Bab., non W. & N.).
10. ,, *villicaulis* W. & N.
   ,, *Salteri* Bab.
   ,, *calvatus* Blox.
   ,, *adscitus* Genev.

11. *Rubus umbrosus* Arrh. ex parte, non Weihe (*R. carpinifolius* Blox., non W. & N.), (to be compared with *leucandrus* and *Neumanni* Focke).
12. ,, *macrophyllus* W. & N.
,, *Schlechtendahlii* W. & N.
,, *amplificatus* Lees.
,, *pyramidalis* Kalten., non Bab. (*hirtifolius* Muller).
13. ,, *mucronatus* Bloxam, non Seringe (*mucronulatus* Bab., non Boreau).
14. ,, *Sprengelii* W. & N.
,, *Borreri* Salter.
,, *rubicolor* Bloxam.
15. ,, *leucostachys* Schleich.
,, *vestitus* W. & N.
,, *Leightonianus* Bab. (*hirsutus* Wirtgen).
16. ,, *infestus* W. & N.
,, *egregius* Focke ?
,, *Purchasii* Blox.
,, *festivus* Wirtg. ? (*Lejeunii* Bab., non W. & N.).
,, *exsecatus* Mull. (*foliosus* Bab., non W. & N.).
,, *adornatus* Mull.
,, *Colemanni* Blox.
17. ,, *Radula* W. & N.
,, *Leightoni* Lees.
,, *echinatus* Lindl. (*rudis* Bab., non W. & N.).
,, *mutabilis* Genev.
,, *badius* Focke ? (*fuscoater* Bab., non W. & N.).
,, *præruptorum* Boulay.
18. ,, *Babingtonii* Salter (*scaber* Bab., non W. & N.).
,, *Bloxami* Lees.
19. ,, *horridus* C. F. Schultz (*ferox* Weihe ; *dumetorum* Warren ; W. & N. ex parte).
,, *diversifolius* Lindl.
,, *tuberculatus* Bab.
,, *tenuiarmatus* Lees.
,, *pilosus* Warren.
,, *emersistylus* Boulay (*Bagnallii* Blox.).
,, *Briggsii* Blox.
20. ,, *Koehleri* W. & N.
,, *apricus* Wimm. ? (*pallidus* Bab., non W. & N.).
21. ,, *rosaceus* W. & N.
,, *hystrix* W. & N.
22. ,, *hirtus* Waldst. & Kit.
,, *saxicolus* Mull. (*humifusus* Bab., non W. & N.).
23. ,, *Bellardi* W. & N.
,, *dentatus* Blox.
,, *rotundifolius* Blox.
24. ,, *flexuosus* Mull. & Lefev. (*saltuum* Focke ; *Guntheri* Bab., non W. & N.).
25. ,, *longithyrsiger* Lees MSS. (*pyramidalis* Bab., non Kalt.).

ON THE FLORA OF THE UPPER TAMAR AND NEIGHBOURING DISTRICTS.

By the Rev. W. Moyle Rogers, F.L.S.

(Continued from p. 14).

Prunus spinosa L. — *P. insititia* L. I. About Bude, Marhamchurch, and Widmouth, in several spots. III. Near Bridgerule Bog, in plenty. Tinney. IV. Near Sutcombe, one spot. Beaworthy. Okehampton. — *P. domestica* L. Denizen. I. Between Poughill and Widmouth, rather frequent. IV. Near Sutcombe, one bush. Not seen in fruit.—*P. avium* L. and *P. Cerasus* L. Both generally distributed, but *Cerasus* the more abundantly.

Spiræa Ulmaria L.

Agrimonia Eupatoria L. Generally distributed, but in remarkably small quantity, except near the sea. — *A. odorata* Miller. II. Near Curry Lane. III. Near Parnacott. Bridgerule, in several places and good quantity. Clawton. North Tamerton. Tetcott, in plenty. IV. Near Sutcombe.

Poterium Sanguisorba L. Apparently rare. I. Sandymouth Cliffs. Bude (Webb). III. North Tamerton, in one place.

Alchemilla arvensis Scop.

Potentilla Fragariastrum Ehrh. — *P. Tormentilla* Schenk. — *P. procumbens* Sibth. I., II., and III. Common. IV. Near Sutcombe. —*P. reptans* L.—*P. Anserina* L.

Comarum palustre L. Remarkably frequent for S.W. England, where usually it is quite rare. I. Lord's Meadow, Kilkhampton. II. By canal, near Red Post and below Newacott. III. Tamar Valley, 1882; common from the Reservoir to below Bridgerule. Pancrasweek. Parnacott. By Bridgerule and Holsworthy Road. IV. Near Bradworthy, and frequent between it and Holsworthy.

Fragaria vesca L.—*F. elatior* Ehrh. III. By the canal, in some quantity above Parnacott; denizen.

**Rubus Idæus* L. I. Kilkhampton. II. By canal, occasional. III. Between Bridestow and Lifton. IV. Bradworthy. Sutcombe, frequent. Between Thornbury and Holsworthy. Beaworthy. Okehampton. No doubt native, but uncommon, except in IV.—*R. suberectus* Anders. I. Roadside thicket north of Launcells Vicarage. Minster Valley. III. By the Reservoir. Pancrasweek. Between Parnacott and Holsworthy. Bridge Moor. Pyworthy, in two places. Between Affaland Down and Clawton. Tetcott. IV. Sutcombe. Between Ashbury and Beaworthy. — *R. fissus* Lindl. I. Lord's Meadow, Kilkhampton. Heath north of Yealm Bridge

---

* These Rubi notes were written before the appearance of Mr. Baker's paper on the genus iu this year's Journal. If his views should become generally accepted, the plants which I have named *affinis*, *carpinifolius*, and (at least in part) *adscitus* will, in future catalogues, be named respectively *montanus* Wirtg., *villicaulis* var. *microphyllus*, and *pubescens* W. & N.; not to speak of other changes which the later portions of his paper may suggest in the groups *Radulæ*, *Glandulosi*, and *Cæsii*.

(Baker). Down between Whitstone and Week St. Mary. Greena Moor. III. Bridge Moor, 1882. Moor, Pancrasweek. Roadside between Pyworthy and N. Tamerton. Dunsland Cross Moor. IV. Near Ugworthy Moor. Between Holsworthy and Thornbury. Moors, Beaworthy and Ashbury. — *R. plicatus* W. & N. III. Dux Common, 1883. By Lower Bridgerule Bog. Tinney Moor. IV. Between Beaworthy and Ashbury. Okehampton, near the river.— *R. hemistemon* Müll. IV. Okehampton, between the river and railroad, in plenty, 1883. — *R. affinis* W. & N. I., III., and IV. Frequent. Here probably (under var. *lentiginosus*) must come a strongly arching plant, which Mr. Briggs has found near Tackbeare (I.) and in the Tamar Valley (II.), and which he thinks may be the *R. incarnatus* Müll. All the districts are especially rich in *suberecti*. A majority of these (mostly) moorland bushes appear to me to belong to intermediate forms. The foregoing have been named (not without considerable hesitation in some cases) after prolonged study and much consultation; and, as on so many previous occasions, my obligations are great for help most kindly rendered in my study of these and all the Rubi by Prof. Babington, and Messrs. Briggs and Bagnall.—*R. Lindleianus* Lees. I. Kilkhampton. Hill east of Wanson Mouth. Greena Moor. II. By canal, rather frequent. Near North Tamerton Church. Near Launceston (J. G. Baker). Bridgerule, sparingly. Near Pyworthy. Tinney. Ash Grove. Between Lifton and Bridestowe. IV. Between Holsworthy and Bradworthy. Between Beaworthy and Ashbury. Near Okehampton. One of the most generally distributed species, but hardly abundant anywhere; while the bramble alluded to in Fl. Plym. (p. 112) as allied to it is one of the two commonest, *R. umbrosus* Arrh. being the other.—*R. rhamnifolius* W. & N. Rather common. I. Kilkhampton. Burrow. Greena Moor. Valley of Rocks. Trebarwith. II. By canal, south of Newacott. III. Bridgerule, frequent. Between Parnacott and Holsworthy, and about Holsworthy. Dunsland Cross. IV. Okehampton. — *R. imbricatus* Hort. Rare. I. Burrow, a few bushes. II. In two lanes near Bridgerule, in very small quantity. IV. Near Okehampton. — *R. discolor* W. & N. Locally common in all the districts. — *R. thyrsoideus* Wimm. I. Roadside thickets north of Launcells Vicarage; not typical. — *R. leucostachys* Sm. Fairly common in all the districts, but much of it off the type. A form with deeply cut foliage and remarkably red flowers is especially abundant in Bridgerule East (III.).—*R. hirtifolius* Müll. III. Near Pyworthy. Near Dunsland Cross, 1882. IV. Between Ugworthy Moor and Soulden Cross. Differing very slightly from the Plymouth plant. — A bramble which my son brought me (1885) from Bridge Moor (III.), and which I have not seen elsewhere, Mr. Bagnall has named "Bloxam's *Salteri*." — *R. calvatus* Blox. I. Road across Greena Moor. III. Parnacott. Near Bridge Moor. Between Pyworthy and Tamerton. Tinney. Roadside south-east of Dunsland Cross Railway Station, in plenty. IV. Beaworthy. Near Okehampton, 1882. I find that I do not yet understand this bramble; so I give here only the two or three localities in which Mr. Briggs

has pointed it out to me, with some others which he has reported. — *R. carpinifolius* W. & N. III. Broad furzy roadside between Parnacott and Holsworthy. Field south of Loudgworthy Lane, Bridgerule, IV. Moor south-west of Okehampton, 1885. — *R. villicaulis* W. & N. I. Bude. Jacobstow. St. Knighton's Kieve. II. Tamar Valley, south of Newacott. III. Bridgerule. Near Holsworthy. Tetcott. IV. Bradworthy. Between Beaworthy and Ashbury, frequent. Near Okehampton. — *R. adscitus* Genev. I. Marhamchurch. Jacobstow. Pentargan Bay. Near St. Knighton's Kieve. Boscastle and Tintagel, common. II. Whitstone. III. Bridgerule and Tinney, frequent, but rather variable in character. Pyworthy. Tetcott. Near Dunsland Cross. IV. Frequent. — *R. umbrosus* Arrh. Remarkably common, but more variable in character than in the Teign Valley. — *R. macrophyllus* W. & N. I., II., III. Frequent.— *R. mucronulatus* Bor. I. Launcells, near the Church and Vicarage, abundant. — *R. Borreri* Bell Salt. IV. On a common about two miles from Okehampton. — *R. Hystrix* Weihe. II. Wood-border near St. Stephen's. IV. Near Okehampton. — *R. rudis* Weihe. II. Near Launceston (Baker). III. Near Dux Common, in very small quantity. Between Parnacott and Holsworthy, abundant. Near Holsworthy. On the road to Stratton. — *R. Radula* Weihe. Only locally common. I. Near Kilkhampton. Launcells, below the Church, in plenty. Greena Moor. II. By the canal, below Newacott. North Tamerton, between the Church and Ogbeare House. III. By Reservoir. Between Parnacott and Holsworthy, in plenty. Bridgerule, scarce. Between Pyworthy and Tetcott, in several places. Common at Tetcott. IV. Frequent. — *R. Kœhleri* Weihe. Rare. I. Minster Valley, among furze, in plenty; a beautiful small form approaching *pallidus*. III. In the Bude and Holsworthy Road, near Pancrasweek. In one spot near Parnacott. Roadside, Tetcott.—*R. diversifolius* Lindl. I. North-east end of Summerleaze Down, abundant. Between Marhamchurch and Butsburrow Cross. Near Burrow. III. Near the Reservoir. Pancrasweek, in some quantity. Between Parnacott and Holsworthy. Between Pyworthy and Derriton, and between Pyworthy und North Tamerton. Near Dunsland Cross. IV. Near Soulden Cross. Near Bradworthy. Between Beaworthy and Ashbury. — "*R. dumetorum* with ascending sepals." I. "Heath north of Yealm Bridge" (Baker). — *R. dumetorum*, var. *pilosus* Warren is Mr. Bagnall's naming for a corylifolian form from Summerleaze Down (I.). — *R. pyramidalis* Bab. II. Near Launceston (Baker). III. Norwood Hill, in good quantity. — *R. Güntheri* Weihe. III. Wood-border near Tetcott Church.—*R. glandulosus* Bell, a. *Bellardi*. IV. Two places near Bradworthy (widely separated), on the Holsworthy Road. Agreeing well with the plate in 'Rubi Germanici,' and distinctly differing from any other form of *glandulosus* that I have seen.—b. *hirtus*. Locally common. I. Kilkhampton. Between Stratton and Launcells, in plenty. St. Knighton's Kieve. III. By Reservoir. Parnacott, wood and by canal, in great quantity. Between Bridgerule and Holsworthy. Pyworthy, near Bounds' Cross. Tinney. North Tamerton. Near Dunsland Cross. IV.

In the Waldon district, rather frequent. Okehampton. — *R. Balfourianus* Blox. Fairly common, and usually well marked. I. Near Titson. Boscastle, in good quantity. II. By canal near Newacott, and in field further to the south-west near the Kilkhampton Road. III. Parnacott. Bridgerule and Holsworthy Road. Field between Tatson and Loudgworthy. Near Ford, Clawton (form approaching *corylifolius*). Near Dunsland Cross. IV. Between Beaworthy and Ashbury. frequent. — *R. corylifolius* Sm., a. *sublustris*. Common, though rather locally so. — b. *conjungens*. I. Boscastle, in several spots.—*R. althæifolius* Host. I. Minster Valley. III. Bridgerule, in two or three places. — *R. cæsius* L. Rare. I. Near the coast, Bude (Baker!). Boscastle.

Geum urbanum L.

Rosa spinosissima L. I. Coast, frequent from Sandymouth to Trebarwith. Between Hoppicott Down and Red Post, in several places (some of it the *R. consimilis* Déségl. Mon., or near it). II. Moor south of Merrifield.—*R. tomentosa* Sm. Type and forms very near it frequent in all the districts.—d. *scabriuscula* Sm. Rare. I. Near Stratton and Marhamchurch. Near Simondsham Farmhouse. III. Parnacott. Bridgerule, in two spots. IV. Between Beaworthy and Ashbury, one very handsome bush. — e. *sylvestris* Lindl. I. Near Marhamchurch. — *R. micrantha* Sm. Quite common, as in Devon and East Cornwall generally. — *R. canina* L., a. *lutetiana*, and e. *dumalis*. Common, especially the latter.—f. *biserrata*. Fairly frequent. I. Between Bude and Poughill, in some quantity. III. Near Parnacott, in Holsworthy Road. Bridgerule. IV. Near Okehampton. — g. *urbica*. Hardly common. I. Hoppicott Down; and on high road near, for some distance (apparently the form *R. platyphylla* Rau.). Near Widmouth. Near Boscastle, in one spot. II. Between Red Post and Butsburrow Cross (round fruited form). Bridgerule, by canal, in plenty (small form approaching *frondosa*). III. Parnacott, Bridgerule, and Tinney, a few bushes. IV. Near Beaworthy,—Var. *obtusifolia* Desv. I. Hill east of Wanson Mouth. II. and III. Rather common.—m. *tomentella* ("less hairy and less serrated than type," J. G. Baker; so approaching *frondosa*). I. Lane near Bude, several. Roadside between Marhamchurch and Burrow. III. Furze, Bridgerule.—o. *verticillacantha*. III. Bridgerule, "Bridge Park," several together.—Var. *latebrosa* Déségl. III. Southlands Plantation.— *R. leucochroa* Desv. I., II., III. Rather common.—*R. stylosa* Desv., a. *systyla*. Fairly frequent throughout, though not so very common as in S.W. England generally. — *R. arvensis* Huds.—b. *bibracteata*. Uncommon. I. Minster Valley. II. Bridgerule, scarce. III. Bridgerule. Near Ford Mill. Tetcott. IV. Holsworthy and Thornbury Road.

Mespilus germanica L. Denizen. II. Near Grimscott, on the Kilkhampton Road, three or four low bushes in hedge. Possibly a native in some spots about Plymouth, Mr. Briggs thinks. I have found it only in this one rather unsatisfactory locality.

Cratægus Oxyacantha L. Only b. *monogyna*; as generally in the south-west, where I have never met with *oxyacanthoides*.

Pyrus torminalis Ehrh. Rare. I. Stratton and Holsworthy

Road, about one mile from Stratton, for several yards. II. Between Bridgerule and Whitstone, in several places. III. Near Hollaton, towards Bridge Moor. About a mile from Holsworthy, on the Bideford Road, several. — *P. latifolia* Syme. Rare, but apparently native, growing, like the last, on hedge-banks and in wood-borders. I. Between Marhamchurch and Titson, in two places. III. About half a mile from N. Tamerton, on the Bridgerule Road, in two or three places. Tetcott, several together in wooded lane south of the Church. This seems widely spread through Devon and East Cornwall. Last summer I found it in East Devon, near Molland Railway-station. — *P. Aucuparia* Gaert. — *P. Malus* L. I., II., III. Common, *acerba* being, I think, the more frequent form. IV. Between Bradworthy and Soulden Cross.

Lythrum Salicaria L.

Peplis Portula L. (To be continued.)

NOTES ON *LIGHTIA* AND *ERISMA*.

By B. Clarke, F.L.S.

Lightia licanoides (Spruce 3143). — Flowers in racemes. Calyx tubular, enclosing the ovary, which appears as if sunk in it; segments 5, very much imbricated, ovate-lanceolate, bringing to mind those of *Erisma*. Petals 3, inserted on the tube of the calyx, spatulate, obovate, twice the length of the sepals. Stamens 5, perigynous, 4 of them nearly as long as the petals; the filaments of the 4 are filiform only in the upper half; these 4 are lateral and completely combined in pairs, each pair forming one broad filament at the base; the remaining one only about half the length of the 4, with a much smaller anther and a more slender filament, not enlarged at the base, and quite distinct at the base from the others. The combined filaments of each pair of lateral anthers are both of them very hairy on the side next the small separate stamen, and quite smooth on the margin of the opposite side (the anterior side?). The 2 petals alternating with the smaller stamen very hairy; the one alternating with the 2 pairs of stamens, of which the filaments are united in the lower half, quite smooth; this is probably the anterior one.

Ovary densely downy, 3-celled, terminating in an elongated slender style as long as the 4 longer stamens; stigma small, capitate. Ovules 2 in each cell, attached side by side (not one above the other) to the internal angle of the cell, ascending, completely anatropal, with an inferior foramen, which is close to the very short funiculus by which the ovule is attached to the placenta.

The affinities of this genus appear to be entirely with *Vochysiaceæ*, as stationed in Bentham & Hooker's Gen. Plant., it being very near *Erisma*; and its agreement with the *Chrysobalaneæ* through *Licania* is only in its habit, as the stamens, although unilateral, are very different from those of the latter family; and the ovary is completely syncarpous, with a long slender style; whereas in *Licania* the style is basal, an indication that if there

were 3 carpels the ovary would be apocarpous. From the peculiarities of the stamens of the single flower examined it would appear that the odd sepal is next the axis, as in other *Vochysiaceæ*.

In *Erisma violacea* the ovules are 2 collateral, attached to a projecting process of the placenta, amphitropal, with an inferior foramen. The ovule is attached by its side for some length, so that there is no funiculus. Its lower third is free from the placenta, and projects nearly to the base of the cell, having the foramen at its apex; the upper end has a thick chalaza, like a small knot. From descriptions it would appear that no other genera of *Vochysiaceæ* have an inferior foramen, and, if so, these two might be separated as a distinct section, offering one of the most conclusive evidences that the position of the foramen is not much to be relied on as an indication of affinity between orders more or less allied.

SHORT NOTES.

Helleborus fœtidus in Glamorganshire (p. 23). — This plant had long since been considered a true native in Glamorganshire, where it was discovered by the late Dr. Maton, many years since, growing in some plenty among hedges south of "Park Mill," in the peninsula of Gower, near Swansea. Dr. Maton shortly afterwards visited the locality in company with Dillwyn, the author of the 'Botanist's Guide,' and they saw no reason to doubt its real nativity. I have observed it more or less abundantly in the above locality for several successive seasons since 1838. The late Mr. H. C. Watson informed me he might have been a little too hasty in *not* considering *H. fœtidus* truly wild in Glamorganshire, after he had printed 'Topographical Botany.'—T. Bruges Flower.

Irish Hieracia.—I was well pleased to observe that Mr. Hart has been so fortunate as to add another hawkweed to our Irish list. His plant from the Mourne Mountains is very interesting indeed. Last August I found in these mountains still another, which there is every reason to believe will prove to be an addition to our Flora. The plant occurs near Newcastle, County Down, at an elevation of about 1500 feet, and was taken by me as an aberrant form of *H. vulgatum*. Mr. Backhouse doubtfully refers it to *H. stelligerum* (*flocculosum*). Prof. Babington says, "Your specimen is in bad condition, and I am doubtful, but *flocculosum* is the nearest to it." In the coming summer I hope to make it quite certain. The *Hieracia* of the Irish mountains require more investigation.—S. A. Stewart.

Naias flexilis Rostk., at Killarney. — When looking over in the autumn the sheets of *Callitriche* which I had gathered on the shores of the large lough at Killarney, I noticed one specimen of a different tint and different growth from the rest, and at once recognized it as a *Naias*. It was of a rather more luxuriant growth than any of the specimens we had taken at Roundstone; but on referring it first to the Rev. W. R. Linton, and then to Mr. Arthur

Bennett, both were of opinion that it was *N. flexilis*. It had already occurred to me that the deeper water of a large lough might alter the size of the plant. I have carefully considered whether it was possible for the specimen to have strayed from the sheets containing my plants of *Naias* from Roundstone; but as both sets of plants were kept all along in the same folded sheets in which they were dried, I am certain that no mixing could have taken place. It was along the northern edge of the extreme west point of Ross Island that this specimen was picked up. I hope other botanists who visit Killarney will look out for more of it.—E. F. Linton.

Hieracia Notes.—Some of the *Hieracia* gathered by the Rev. W. R. Linton and myself in 1884 were not settled immediately; and in the case of two or three we were not aware of their being unrecorded in 'Topographical Botany' (2nd ed.). We are now able to add these to the previously recorded localities. There are also two to mention, found in 1885:—*Hieracium eximium* Backh., var. *tenellum*. Fairly plentiful at 2700–2800 feet, in Corrie Etcachan, Aberdeen south. No doubt noticed and recorded before now.—*H. pallidum*. Rather plentiful on the walls of Penard Castle, Glamorgan. A somewhat peculiar form, which Mr. Backhouse, not being informed of the colour of the styles, hesitated whether to call *pallidum* or *cæsium*. The styles were clear yellow; and my original naming therefore stands. It is a little strange if there is no previous notice of this *Hieracium*, since this is the one locality for *Draba aizoides* L. The *Draba* was in good quantity, and was taking good care of itself, growing chiefly out of reach.—*H. nitidum* Backh. Clova, Forfar, 20th August, 1884, I think this may fairly be put down for Forfar now. Some plants which I so named on gathering were disputed by a friend, and laid aside; but when, last autumn, they were referred to Mr. Backhouse, they were returned as "probably seedling *H. nitidum*, but not in character." I happen to have two or three specimens of a similar *Hieracium*, which I had also named *H. nitidum* but not sent up for confirmation, from Glen Canness, Forfar (Aug. 18th, 1884); these are plants of older growth, and exactly what the younger plants of Glen Clova might be expected to develop into. I am quite satisfied that these two are one species.—*H. vulgatum*, Fr., with *yellow styles*. Rugby, Warwick, July 28th, 1885. I found this while waiting two or three hours for the Irish mail, and *H. umbellatum* L. growing with it. Neither species is new to the county; but it is at least unusual to see this species with a clear yellow style. I may here mention *H. umbellatum* L., between Woodford and Rossmore, Galway East, August 6, 1885; a scarce plant in Ireland seemingly, and not recorded for this district before our notice of it. *H. gothicum* Fr. was mentioned hesitatingly in our list of plants for Skye in Journ. Bot., 1884, p. 368. The doubt is now removed, as Mr. Backhouse has confirmed the naming, —*H. strictum* Fr. Glen Shee, Perth, E., Aug. 16, 1884. This, which growing with *H. crocatum* we thought was *H. corymbosum*, Mr. Backhouse names as above.—*H. crocatum* Fr. Uig, Skye

(Eb. North), Aug. 6, 1884. This grew sparsely around the bay, both sides of the village.—E. F. Linton.

Caithness Botany.—Dr. A. Davidson, at p. 23, remarking on the number of species as inhabiting the county, observes "Probably not more than 450, including varieties." This is too low an estimate. Without going very carefully through my records for the county I may safely say, that 550 will be far nearer the number; and I believe that 600 will not over-represent the Flora, including varieties, at present known. I take this opportunity of recording some additional plants to those recorded in Top. Bot., ed. 2, and Messrs. Hanbury and Fox's list. Several of the species mentioned in that list I already possess, from Mr. J. Grant, who discovered them:—*Viola Curtisii* Forst., *V. lutea* Huds., *Arenaria trinervia* L., *Geranium sanguineum* L., *Prunus spinosa* L., *Rosa tomentosa* Sm., *Epilobium parviflorum* Schreb., *Myriophyllum spicatum* L., *Callitriche platycarpa* Kuetz., *Ribes petræum* Sm., *Hieracium anglicum*, Fr., *H. strictum* Fr., *H. crocatum* Fr., *H. corymbosum* Fr. Mr. Grant has also sent specimens of a *Hieracium* that is not yet determined, possibly new to Britain. *Azalea procumbens* L., *Teucrium Scorodonia* L., *Myosotis palustris* With., *Trientalis europæa* L., *Atriplex Babingtonii* Woods, *β. virescens* Lange, *Salix phylicifolia* L. (*fide* Leefe), *Habenaria viridis* Br., *Paris quadrifolia* L., *Potamogeton filiformis* Nolte, *Sparganium minimum* Fr., *Typha latifolia* L., *Carex flava* L. var. *lepidocarpa* Tausch. I believe the true plant; I have only seen it elsewhere in Britain from York. *C. Œderi* Ehrh., *C. fulva* Good., *C. vaginata* Tausch., *C. salina β. kattegatensis* (Fr.) Almq., *Agrostis alba β. gigantea* Koch (*fide* Hackel), *Aria cæspitosa* var. ?, *Calamagrostis strigosa*, Hartm., *Sclerochloa maritima* Lindl. (2 forms), *Poa pratensis* L. var. *subcærulea* Syme, *fide* Hackel, *Bromus asper* Murr., *Festuca ovina* L. var. *capillata* Hack., *F. rubra* L. subvar. *grandiflora* Hack., *F. elatior* L. var. *pseudo-loliacea* Hack.; these three *fide* Hackel. I have somewhere seen it remarked that the Flora of West Sutherland is a rich one, and undoubtedly the coast is so; but a comparison with Caithness does not support this for the county as a whole. There are in Caithness 114 species not found in Sutherland; while there are 94 found in Sutherland and not in Caithness. In the Orkneys there are 52 not found in Caithness; in Caithness, 92 not found in the Orkneys. Dr. R. Brown (Campst.) tells me that he distributed his Caithness plants "among friends and fellow-students"; I should be glad to know if any of these are in existence.—Arthur Bennett.

NOTICES OF BOOKS.

Flore complète de la Belgique; espèces indigènes et plantes cultivées sans abri. Par André de Vos. Mons, Manceaux. 1885. Sm. 8vo, pp. xxiii. 739.

This is a work to some extent novel in execution; the author boldly declares his wish to adopt a new course, and, while asking pardon of his *confrères* for the trouble he may give them, recommends

them to compare the old with the new. Dedicating his book to M. Alphonse DeCandolle, he adopts the classification of M. Van Tieghem in his 'Traité de botanique' (1884)—the flowering plants beginning with the *Compositæ*, ending with the *Taxineæ*, the Ferns and allies following. The book closes with lists on botanical bibliography, general and local, and published Exsiccatæ of the Mosses, Fungi, and Lichens.

The critical botanist must not look here for answers to his difficulties; but he who requires a reply to a simple query respecting plants cultivated in Belgium will find it, often accompanied by interesting particulars as to introduction into Europe, use, produce, history, &c.; thus a whole page is devoted to *Nicotiana Tabacum*. Insects found on or destroying various plants are also mentioned.

The Flemish names of genera and species are also given; we hope the few authorities he quotes really give the actual Flemish names, and not such opinions and meaningless substitutes as are often found in an English book.

According to the author his book contains more than 3000 species, native, naturalised, and cultivated; and compressed into its pages there is a large amount of interesting information only to be found by consulting a good many larger works. The information, too, seems well brought up to date, and the botanist will find many hints that he may look for in other Floras (of a like nature) without success—such as the latest Monograph, or writer on an order or genus, price of books, &c.: these matters may not be much in themselves, but they go far to render the work one that is really *used*, and not left on the shelf.

As an example of the treatment of critical genera, *Ranunculus* (*Batrachium*) may be quoted. The author has (excluding *Lenormandi* and *hederaceus*) six species—*divaricatus*, *fluitans*, *hololeucos*, *Baudotii*, *trichophyllus*, and *aquatilis* L. In the key of the species he distinguishes *aquatilis* from *trichophyllus* by leaves collapsing into a pencil when taken from the water. This test seems misleading when we take into consideration the great difference in amount of incrustation among aquatic plants. Its fallacy would probably be proved if the two forms were cultivated. Aquatics change greatly in appearance and flexibility when cultivated; this is notably the case in the *Characeæ*.

That the species of Batrachium Ranunculi have been excessively multiplied seems to be beyond denial, if we take the usual acceptation of the term. What is really wanted is some one in each country with time and opportunity to cultivate all the forms, and do as the late Mr. H. C. Watson did with the Chenopodia—watch, and dry the results year by year. It might be found that the asserted action of swift streams on these plants would not prove so great as sometimes supposed.

As a 'Flora of Belgium,' for the botanist's part, this book may not be of great value; but as a handy little guide covering a wide field its worth is considerable.

ARTHUR BENNETT.

The Orchid-Grower's Manual, containing descriptions of the best Species and Varieties of Orchidaceous Plants. By B. S. Williams. 6th edition. London: Victoria Nurseries, Holloway. 1885. 8vo, pp. 660; price 6*s.* 6*d.*

Extensive as is already the list of horticultural works on Orchids, this book fills a vacant place for which the more expensive and beautifully-illustrated works are not suited. Orchid-lovers are on the increase: not perhaps that many more of the wealthy class are imbued with interest in these plants, but rather that more of the gardeners on a smaller scale are beginning to see that many species can be successfully cultivated even in a small house and with small means. To these especially this work will be useful. That it has proved acceptable in the past is attested not only by its having reached a sixth edition, but also, as stated in the Preface to the present edition, in its having been translated even into Russian.

This edition is no mere reprint of the former one. It is very much increased both in text and in woodcuts, many of the latter of which will be familiar to the readers of our horticultural journals. No branch of the subject has been neglected. The habitats, means of collecting, treatment at all seasons and stages, propagation, exhibition, structure of orchid-houses, are all dealt with in the first portion of the book, the remainder of which is taken up with the accounts of the best species for cultivation, and the special treatment of each. The genera are arranged alphabetically, and there are numerous references to plates, synonyms, &c.

In looking over some of the more popular genera in a horticultural work of this nature one cannot but be struck by the number of species only known in cultivation. Collectors of dried plants seem rarely to preserve specimens of fine or showy species, if they meet with them; and again many, perhaps most, of our finest cultural plants are only obtained by live-plant collectors, who, with a few notable exceptions, do not dry even a few flowers of their discoveries. The result of this is that there are comparatively few specimens of wild plants of the more showy genera in the herbariums of this country. This is to be regretted, as points of some difficulty as to specific distinctive characters are sometimes obscured by the alteration which the plants have undergone in transmission to this country and cultivation herein.

Perhaps it may not be out of place here to raise again the oft-repeated protest against giving specific names to artificial hybrids. This objectionable practice adds largely to the already extensive synonymy, and is apt to lead to much confusion. The crime has been committed even by those in high places, but we are glad to see that the Horticultural Society has set its face against it and does its best to stop it. And again, it is difficult to see why varieties of *Cattleya labiata*, for instance, should be honoured with special scientific names, while Roses, Primulas, and other florists' flowers take simply fancy names. Of course in a book like the present we do not expect to meet with reforms of this sort, as the author is bound to adhere to the well-known names; but it would be highly

satisfactory if namers of new cultural varieties would turn their attention to this matter. H. N. RIDLEY.

Report on the Progress of the Botanical Gardens at Saháranpur and Mussoorie for the year ending 31*st March*, 1885. [By J. F. DUTHIE, Superintendent]. Allahabad, 1885, fol. pp. 51.

THIS Report contains, besides information connected with the Saháranpur Gardens, an interesting account of an excursion undertaken by Mr. Duthie to North-eastern Kumann in 1884. He succeeded in re-discovering, in large quantity, the rare *Circeaster agrestis* Maxim., a plant of doubtful affinity, originally collected in the same region by Strachey and Winterbottom, and subsequently detected in North China by Prejvalsky. Several new names are published, though only one species is fully described, *Primula Reidii*, and this description we reproduce, as it is likely to be overlooked:—"*Primula Reidii*, n. sp.—Leaves ovate, lanceolate, clothed with silky pubescence; scape erect, firm, 2 to 4 inches long; flowers 2 to 3, in umbels, large, drooping; calyx broad, snowy white inside; teeth triangular, acute; corolla about 1 inch across, cream-coloured, its tube exceeding the calyx, and mealy white at the base; capsule globose." (Saháranpur Report, 1885, p. 30). The Appendix of "New species and others not previously recorded for Kumann" (pp. 42–46), contains also the following:—*Delphinium densiflorum*, n. sp. "?," *Arenaria ferruginea*, n. sp., *Saxifraga Stolitzkæ*, n. sp., *Sedum tillæoides*, n. sp., *S. filicaule*, n. sp., *Tricholepis hypoleuca*, n. sp., *Lactuca filicata*, n. sp., *Polygonum parvulum*, n. sp., *Scirpus dissitus* C. B. Clarke, MS., *Kobresia Duthiei* C. B. Clarke, MS. Of these the *Tricholepis* and *Polygonum* are partially described at pp. 38 and 48 respectively. On p. 35 a saxifrage is styled "*S. lycopodioides*," followed by the remark "Probably = *S. afghanica*, Aitch. and Helmsley" [Hemsley]; and on p. 37 Mr. Duthie writes, "I propose *A. nepalense* as the name for [an *Arceuthobium*], as it is clearly a distinct species" from *A. Oxycedri*; and adds in a foot-note, "previously named by Sir Joseph Hooker *A. minutissimum*." Of course such *nomina nuda* are entitled to no recognition; but it is much to be regretted that, in the last two cases especially, they should be allowed to appear in print.

IN 'Studies of Plant-life in Canada' (Ottawa, Woodburn), the author, Mrs. C. P. Traill, gives us a handsome book, the Preface to which contains an interesting account of her difficulties in becoming acquainted with the native flowers of Ontario. "At the age of eighty-three years" Mrs. Traill completes her work; and although we may feel that her hope that her volume may rank with White's 'Selborne' is a little ambitious, we cannot but recognise that the two books have more in common than might be supposed. There is the same strong personal interest and affection running through both—the same simple record of careful observation characterises the two. Little personal anecdotes and reminiscences; rustic

remedies from "old settlers' wives and choppers and Indians"; descriptions of habit and habitat which could only be written by an observer; all these make up an interesting volume. The coloured plates are not up to the level of the letterpress. Although Mrs. Traill does not claim to be a botanist, her name has been associated by Prof. George Lawson with a variety of Shield Fern, *Aspidium marginata* var. *Traillæ*.

Mr. J. S. Stallybrass has given us a translation of Prof. Hehn's very interesting work on 'The Wanderings of Plants and Animals from their first Home' (Sonnenschein & Co.). It deals with the problems which the title suggests from a classical and philological rather than from a biological standpoint, and contains much that is suggestive as well as interesting. The author—to quote from Mr. Stallybrass's preface—"holds that Europe owes much more to Asia than the mere botanist and mere zoologist are willing to admit. In particular, that the Flora of Southern Europe has been revolutionized under the hand of Man; that the evergreen vegetation of Italy and Greece is not indigenous, but is mainly due to the sacred groves planted round the temples of Oriental gods and goddesses; that in this way the laurel has followed the worship of Apollo, the cyprus and myrtle that of 'Ashtoreth of the Zidonians' (Aphrodite), the olive that of Athena, and so on. At the same time, the reverence for the Olive, the Vine, the Fig, &c., was not all superstitious fancy, but founded on their value to man as the source (and therefore symbol) of a higher type of life." This extract gives a fair idea of the author's treatment of his subject, but it does not convey an adequate notion of the amount of learning of different kinds which he brings to bear upon it.

'Poets in the Garden,' by May Crommelin (T. Fisher Unwin, Paternoster Square), is a handsome volume, not improved, however, by the insertion of some gaudy chromolithographs. As might be gathered from the title, it consists of a series of quotations from the poets relating to our popular garden flowers. It is to be regretted that Miss Crommelin did not secure the assistance of some botanical friend, as she would then have avoided certain errors which are unfortunately somewhat numerous; indeed, we are inclined to think her acquaintance with the flowers is rather through the poets than from actual observation. Thus under "Eyebright or Euphrasy" she has three quotations, two referring to *Veronica Chamædrys* and one to *Euphrasia;* the quotation under "Honesty" does not refer to *Lunaria*, but to *Botrychium;* Lord Lytton's poem on the Aloe clearly refers to a *Cereus;* and under "Acacia" three different plants seem commemorated. The Sundew, Sweet Gale, Dandelion, and the like, would hardly be found "in the garden."

Mr. Elliot Stock sends us an exquisitely-printed little volume entitled 'The Praise of Gardens; a Prose Canto, collected and in part Englished by Albert F. Sieveking.' This is worthy in its own particular line to stand by the side of that most delightful book, 'The Book-lover's Enchiridion.' Beginning with an extract from an

Egyptian MS. of the XIXth Dynasty (B. C. 1300), it brings us down to "Vernon Lee," most of the writers who have made gardens their theme being quoted by the way. We should like to have seen extracts from Henry Kingsley's 'Hornby Mills Garden'; and Mr. Jeffries, although he more usually deals with the uncultured aspects of Nature, might, we think, have been laid under contribution.

Messrs. Cassell send us the fourth Series of their 'Familiar Garden Flowers,' which is unfortunately heralded by a garish cover. It does not differ from its predecessors in style; its illustrations are attractive, though fragmentary, and its letterpress is inaccurate. We open on a long statement *apropos* of *Anemone apennina*, demonstrating the unreasonableness of botanists who "have too much to say about British plants that are possibly not British," and proceeding to state that this plant grows wild in counties which are known not to produce it. The plant figured as *Trollius europæus* seems rather *T. asiaticus*. There is considerable confusion between *Lychnis* and *Silene* in the letterpress which accompanies the figure of *S. pendula;* and the mystical interpretation of the Passion-flower is as original as it is inaccurate.

Mr. Friend has written a pretty little book on 'The Ministry of Flowers' (Sonnenschein & Co.), in which some of the more recent observations upou plants and flowers are shown to be susceptible of moral applicatien.

A translation of M. Paul Bert's 'First Year of Scientific Knowledge' has lately been issued by Messrs. Rolfe Brothers, Holborn. It is a comprehensive and handy little volume, copiously illustrated; the botanical portion, which alone concerns us, is carefully done.

We have received from Venice the first number of a new quarterly journal devoted to algology: 'Notarisia,' edited by Drs. G. B. de Toni and D. Levi.

New Books. — L. Aubriot & A. Dagnin, 'Flore de la Haute-Marne' (Saint-Dizier, Henriot: 8vo, pp. 536, map).—J. Rattray & H. R. Mill, 'Forestry and Forest Products' (Edinburgh, Douglas: 8vo, pp. xliv. 569, 10 plates). — A. Wiesmann, 'Die Bedeutung der sexuellen Fortpflanzung für die Selektions-Theorie' (Jena, Fischer: 8vo, pp. viii. 128).—E. D. Labesse & H. Pierret, 'La Terre et les Végétaux' (Paris, Masson: 8vo, pp. viii. 468, 574 cuts). — M. Willkomm, 'Forstliche Flora von Deutschland und Oesterreich' (Leipzig, Winter: 8vo, pt. i., pp. 80, 18 cuts). — E. Strasburger, 'Manuel technique d'anatomie végétale' (transl. by J. Godfrin: Paris, Savy: 8vo, pp. viii. 405). — L. Lewin, 'Ueber Piper methysticum' (Berlin, Hirschwold: 8vo, pp. 60, 1 tab.). — H. Schenck, 'Die Biologie der Wassergewaechse' (Bonn, Cohen: 8vo, pp. 162, tt. 2).—R. Spruce, 'Hepaticæ ef the Amazon and Andes' (London, Trübner: 8vo, pp. xi. 589, tt. 22). — C. Schröter, 'Der Bambus und seine Bedeutung als Nutzpflanze' (Basel, Georg: 4to, pp. 56, 1 tab.).

Articles in Journals.

Ann. Sci. Nat. (Jan.). — J. Hérail, 'Sur l'anatomie comparée de la tige des Dicotylédones' (5 plates).—G. Bonnier & L. Mangin, 'Sur les variations de la respiration avec le développement des plantes.'—Id., 'La fonction respiratoire chez les végétaux.'

Bot. Centralblatt (Nos. 5–9).—M. Dalitzch, 'Zur Kenntniss der Blatt-anatomie der Aroideen' (1 plate).

Botanical Gazette (Jan. 23). — C. R. Bownes, 'Asa Gray' (portrait). — J. M. Coulter & J. N. Roe, 'Pollen-spores of *Tradescantia virginica*' (1 plate). — J. C. Arthur, 'A new larval *Entomophthora*' (*E. Phytonomi*), 1 plate).—A. Gray, '*Anemone nudicaulis*, n. sp.'

Botaniska Notiser (Häft. 1). — F. Svanlund, 'Anteckningar till Blekinges flora.'

Bot. Zeitung. (Jan. 22, 29). — H. de Vries, 'Ueber die Aggregation im Protoplasma von *Drosera rotundifolia*.' — T. W. Engelmann, 'Zur Technik und Kritik der Bakterien methode.' — (Jan. 29). H. Hoffmann, 'Phänologische Studien.'—(Feb. 5, 12). A. Meyer, 'Bildung der Stärkekörner in den Laubblätten aus Zuckerarten, Mannit und Glycerin.' — (Feb. 12). W. Pfeffer, 'Krit. Besprech. von de Vries: Plasmolytische Studien.'

Flora (Jan. 4, 11). — O. Linde, 'Beiträge zur Anatomie der Senegawurzel' (1 plate). — (Jan. 21). —. Röll, 'Zur Systematik der Torfmoose' (1 plate).—G. Haberlandt, 'Das Assimilationssystem der Laubmoos-Sporogonien.' — (Feb. 1). K. B. J. Forssell, 'Ueber den Polymorphismus der Algen (Flechtengonidien) aus Anlass von Hern Zukal's Flechtenstudien und seinen Epilog dazu.'

Gardeners' Chronicle (Jan. 30). — *Polypodium macrourum* Baker, n. sp. — C. W. Dod, '*Narcissus triandrus* and its varieties' (figs. 31, 32). — (Feb. 6). J. G. Baker, 'Kew and its work.'—'*Primula Reedi* Ducie, n. sp.* — W. G. Smith, *Polyactis vulgaris* (fig. 34). — (Feb. 13). *Adiantum elegans* Moore, "n. hyb. (?)." — W. Watson, 'Root-proliferation in *Platycerium*' (fig. 39). — (Feb. 20). *Goniophlebium caudiceps* Moore, n. sp.

Journal of Royal Microscopical Soc. — A. W. Bennett, 'Fresh-water Algæ (including chlorophyllaceous Protophyta) of the English Lake District; with descriptions of twelve new species' (2 plates).— E. M. Crookshank, 'On the cultivation of Bacteria.'

Oesterr. Bot. Zeitschrift — A. Peter, 'Flora des bayerisch-böhmischen Waldgebirges' (concluded). — J. Röner, 'Ein Ringkampf zweier Wurzeln.' — E. Palla, 'Flora von Kremsier.' — M. Kronfeld, '*Mimosa pudica* während einer Eisenbahnfahrt.'

Pharmaceutical Journal (Feb. 13). — E. M. Holmes, 'Tumbeki' (*Nicotiana persica*).—Id., 'Ergot of Diss.'

Science Gossip.—W. B. Grove, 'A Nettle Fungus' (*Lophiotrema angustilabrum*).

---

* ***P. Reidii.*** **See p. 88.**

LINNEAN SOCIETY OF LONDON.

November 5, 1885.—Sir John Lubbock, Bart., Pres., in the chair. —There was shown for the Baron Von Mueller a collection of skeleton leaves of species of *Eucalyptus*, prepared by Mrs. Lewellin, of Melbourne. These confirm Baron von Mueller's observations as to definite layers, and the relation of these to the skeletonising process.—Dr. Ondaatje showed examples of walking-sticks from Ceylon Palms, *viz.*, the Kittool Palm (*Caryota urens*), the Areca, and Coco Nut.—Mr. J. G. Baker made remarks on tubers of *Solanum Maglia* grown at Kew, the weight of twelve tubers being twenty-eight ounces; also the "papa del Oso," Bear's Potato (*S. tuberosum* var.) grown out of doors from tubers received from Dr. Ernst, of Caracas, who obtained them from Merida, where they are found wild.—Mr. John Ball read a paper entitled "Contributions to the Flora of the Peruvian Andes, with Remarks on the History and Origin of the Andean Flora," referring chiefly to the western slope of the Cordilleras. From the collections made and other data, so far as this region of Peru is concerned, it may confidently be stated that the limit of alpine vegetation has been placed by previous writers on the subject as far too low. In the present instance there can be no serious error as to heights, seeing these are based on those of the railway engineers. The explanation of this relatively high extension of the temperate flora depends on the peculiar climatical conditions. Rain occurs but sparingly, the nights are cool, but frost scarcely known; whereas in the plateau region eastward, storms, heavy snow, and frosts are frequent. The vegetation of the region visited Mr. Ball divides into a subtropical dry zone from coast to 8000 ft., a temperate zone reaching to 12,500 ft., and an alpine zone upwards to 1700 ft. above the sea-level. As regards the proportion in which the natural families of plants are represented in the Andean Flora, the *Compositæ* amount to nearly one-fourth of the whole species, the grasses equal one-eighth, the *Scrophularineæ* supply five per cent., while *Cruciferæ*, *Caryophyllæ*, and *Leguminosæ* each are represented by about one-thirtieth of the whole. The *Cyperaceæ* are conspicuous by their absence; a remarkable feature is the presence of four *Crassulaceæ*. If we take the proportions of the endemic genera and species as criteria, the Andean Flora appears to be one of the most distinct existing in the world. Mr. Ball agrees with those who think it probable that the south polar lands constitute a great archipelago of islands. To this region in question he is inclined to refer the origin of the antarctic types of the S. American Flora.

December 3. — Sir John Lubbock, Bart., Pres., in the chair. —Sir H. E. Maxwell, Bart., Lieut.-Col. L. Blathwayte and Messrs. R. A. Bastow, S. J. Capper, C. Ford, G. B. Howes, J. H. Gurney, jun., W. H. Jones, W. F. A. Lambert, C. T. Musson, W. D. G. Osborne, D. Petrie, and G. Thorn were elected Fellows.—The Rev. Geo. Henslow read a "Contribution to the Study of the Relative Effects of different parts of the Solar Spectrum on the Transpiration of Plants." The conclusions are:—That his experiments prove that

Wiesner's results are correct, and that transpiration *per se* (theoretically distinct from the purely physical process of evaporation, which takes place from all moist surfaces and bodies, dead or alive) is especially, if not solely, referable to those particular bands of light which are absorbed by chlorophyll; and that such light being arrested is converted into heat, which then raises the temperature within the tissues and causes the loss of water. The only additional facts advanced, and that tentatively, are, that yellow light has a *retarding influence* upon transpiration, and that "life" has a retarding influence upon evaporation as distinct from transpiration.—A paper was read by Sir Joseph D. Hooker, "On *Castilloa elastica* Cervantes, and some allied plants." The author states that under the name *Castilloa elastica* probably more than one species exist. The true plant first described by Cervantes has flowered and fruited in Ceylon; it is now fully described and figured, with remarks on allied plants also yielding Panama India-rubber. Seeds collected by Mr. Cross in 1875 failed to germinate, but cuttings were also introduced, and from them plants were distributed to various colonies. Some difficulty is found in propagating by cuttings, as the side branches, which are deciduous, will not strike root; but seedlings have now been raised at Peradenyia, and the culture is therefore assured. An account of the introduction of the plant is appended.

December 17. — Frank Crisp, LL.B., Vice-Pres. and Treasurer, in the chair. — Dr. Maxwell Masters showed a branch with leaves and fruit of *Heritiera littoralis* var. *macrophylla*, received from Prof. Cornu, of the Jardin des Plantes, Paris. The adult leaves were of large size, deep green above, silvery white beneath, from the presence of a very dense investment of peltate membranous scales. The form now shown was considered by Kurz as specifically distinct from *H. littoralis*, but the points relied on to distinguish the two were not in Dr. Masters' experience constant. Flowering specimens had also been received from Mr. Baxter, of the Oxford Botanic Garden. Mr. Nicholson stated that the tree flowered annually in the palm stove at Kew. — Mr. J. G. Baker exhibited specimens of *Lycopodium complanatum*, collected by the Rev. A. Lawson on the Somersetshire side of Exmoor, near Porlock. — Mr. Clement Reid drew attention to a series of fossil plants and seeds from the forest-bed of the Cromer district, Norfolk. Among these were examples of *Pinus sylvestris*, *Abies excelsa*, and *Trapa natans* from Mundesley; *Pinus Abies* from Trimmingham; *Quercus Robur* from Happisburgh; *Osmunda regalis* from Paston, near Barton; and from various localities seeds of *Thalictrum*, *Ranunculus aquatilis*, *Nuphar lutea*, *Taxus baccata*, *Hippuris vulgaris*, *Potamogeton heterophyllus*, *P. crispus*, *P. trichoides*, *P. flabellatus*, *Zannichellia palustris*, *Rumex maritimus*, and *Ceratophyllum demersum*, all in a remarkably fine condition of preservation. — Mr. Thos. Christy exhibited a plant of *Angraecum sesquipedale* in flower, and a plant of *Catasetum purum* showing flowers erect and reversed on the same spike. In none of the flowers was the ovary visibly twisted, but in long-ovaried orchids it is often very difficult to detect the twisting of the ovary

by external aspect. This specimen illustrated the fact that light or the absence of light was not the cause of the alteration of position.—The following specimens were exhibited for Mr. Edward M. Holmes, *viz.* (1) A good example of the fruit of *Afzelia cuazensis*, from Limpopo, Natal, sent to him as the pod of a mahogany tree. (2) The fruit of *Trichilia Dregei*, from the same district; oil is obtained from the seeds by boiling, and with this, probably as an insecticide, the Kaffirs anoint their bodies. (3) *Ustilago marina* Durieu, a fungus new to Britain, and which he had discovered last autumn growing on *Scirpus parvulus* at Studand Bay, Dorset, on ground covered by sea-water.—Mr. Henry N. Ridley read a paper "On a small collection of Orchids from Madagascar." These, fifty in number, were obtained by Mr. Fox in the neighbourhood of Imerina. Among them are a fair proportion of novelties. There are three genera new to the flora of the island, viz., *Arnottia*, indigenous to the Mauritius; *Brownleea*, hitherto only known from South Africa; *Holothrix*, an East African representative. Another interesting plant is *Satyrium gigas*. From this series it is evident that still other orchidaceous species await investigation, for in the herbaria of this country several known to Thouars are yet absent.

January 21, 1886.—W. Carruthers, F.R.S., Vice-Pres., in the chair.—Mr. Harry Veitch exhibited, in illustration of Dr. Masters' paper, a series of living Conifers, among which were:—*Abies magnifica*, *A. lasiocarpa*, *A. concolor*, *A. Fortunei*, *A. subalpina*, *A. nobilis*, *A. grandis*, and *A. amabilis*; also *Pseudolarix Kæmpferi*, *Picea Omorika*, *Pinus Pearcei*, *Arthrotaxis selaginoides*, and *A. laxifolia*.—Mr. E. M. Holmes exhibited a specimen of the Ergot of Diss (*Arundo tenax*) from Algeria. This Ergot is said to be more active medicinally than that of Rye, and is slenderer, and twice or thrice its length, and is attributable to the Fungus, *Claviceps purpurea*.—Dr. Chas. Cagswell drew attention to dried specimens of the species of Maples (*Acer*) of Canada, collected by him in Nova Scotia, and of *Sisyrinchium Bermudiana* and *Bryophyllum calycinum* from Bermuda. He contrasted the great difference of climate and vegetation of the continent and island, observing that the Gulf Stream doubtless had an important influence on the Bermudan flora; moreover, it was notable that *Bryophyllum*, like the maples, put on a brilliant red autumnal tint.—Dr. Maxwell Masters read a paper, "Contributions to the History of certain Conifers." This comprised the result of observations on the mode of growth and structure of various species of Coniferæ, concerning which much difference of opinion had previously existed, owing to the imperfection of our knowledge. Of late years many of these species had been introduced into cultivation, and some of them had produced male flowers and cones, thus affording an opportunity for diagnosing the species and ascertaining their limitations. The study of the cultivated plants had likewise shown the natural range of variation in a species or individual plant under comparatively uniform conditions. Our knowledge of their geographical distribution has also been extended altogether, thus enabling a fresh revision to be attempted.—In exhibiting an extensive series of fossil plants from

the island of Mull, Mr. J. Starkie Gardner made remarks concerning inferences to be drawn from the well-preserved leaves. He mentioned that this fossil Mull flora comprises but one fern undistinguishable from living *Onoclea sensibilis* of W. America and E. Asia. There is an *Equisetum*. The Coniferæ are abundant. A *Ginko* resembles existing species, along with numerous firs and larches, and a yew similar to that of Japan. Monocotyledons are represented by one sword-shaped leaf. There are at least twenty species of Dicotyledons. A *Platanus* obtains differing somewhat from the recent form, and with resemblances to what is known as *Credneria* and *Protophyllum* of cretaceous age. This Mull flora, though possessing few novelties, is interesting, as supplying fresh confirmation of the view first propounded by Asa Gray, that formerly the entire northern temperate regions possessed a very uniform flora.

February 4.—Sir John Lubbock, Bart., F.R.S., President, in the chair.—Mr. Frederick J. Hanbury exhibited and made remarks on a series of forms of the genera *Hieracium* and *Carex*, obtained by him on the coasts of Caithness and Sutherlandshire last autumn, all being new to the British flora and representative of Scandinavian plants. Among these were *H. norvegicum* Fr. and var. *farinosa*, *C. aquatilis* Wahl. var. *cuspidata* Loestad., *C. rigida* Good. var. *infer-alpina* Loeslid, and others, besides a large form of *Euphrasia* from Reay Links, Caithness.—Mr. W. H. Beeby drew attention to an example of *Equisetum litorale* Kuhlerwein, a species new to Britain, gathered by him on Bisley Common, Surrey.—Mr. John C. Sawer exhibited a sample of a superior sort of the essential oil of *Lavandula vera*, and a specimen spike of the plant preserved in glycerine. This plant had been obtained by crossing several good varieties, seeds having been obtained from the South of France, &c., and grown by him near Brighton under conditions imitating the natural habitat of the plant.—Mr. Francis Darwin read a paper "On the Relation between the Bloom on Leaves and the Distribution of the Stomata," the observations thereon having been commenced by his father and himself in 1878. Bloom on leaves is used by him to mean a coating of minute particles of a waxy character, which is removable by hot water or ether. But gradations occur, from a distinct and appreciable greasiness throwing off moisture, to such as are easily wetted. A large series of leaves of different groups of plants have been studied by him, and, for convenience in the analysis of data, he has divided them into four classes. Leaves of Class I. are devoid of bloom on both surfaces, and yield 54 per cent., which have no stomata on the upper surface. In Class II. bloom is deficient above but present below, whereof 83 per cent. contain stomata on the leaves' lower surface. Class III. possesses bloom above, but none inferiorly on the leaves, and 100 per cent. of these have stomata on the upper surface. Class IV. have leaves with bloom on both surfaces, 62 per cent. of them having stomata above. From such analysis and other facts and data given, Mr. Darwin concludes that the accumulation of stomata accompanies that of bloom, and, other

things being equal, that it is functionally protective against undue wetting by rain, and thus injury of the leaf-tissue. The mealiness in Primulas is in some respects peculiar, as is the condition of *Trifolium*, but, as a rule, these do not contradict the above generalisations.—A paper "On the probable wild source of Cultivated True Limes," by Dr. Bonavia, of Kandy, was read by Mr. Dyer. The conclusions of the author are that the wild *Citrus hystrix* DC. is the grandparent of *Limo tuberosus* Rumph. and Lima of Ceylon, and all their derivations of *Limo agrestis*, *Limonis feri*, *Limonellus auriarus*, and others; while also more distantly the grandparent of other cultivated true limes of India, Ceylon, and other parts. It was suggested that the winged petiole of the Lime was derived from its progenitor, *Citrus hystrix*.

BOTANICAL NEWS.

The Norwich Museum has lately received from Sir James Paget a collection of British dried plants and marine Algæ formed some fifty years ago by himself and a brother, since dead, and used by them in compiling their 'Sketches of the Natural History of Yarmouth and its Neighbourhood' in 1834. This collection had been deposited at St. Bartholomew's Hospital, but Sir James was of opinion that it would be of greater value at Norwich, especially as showing the changes which have taken place in the local flora in the course of years. It finds a resting-place in the museum of the county in which it was found, with similar donations of Sir J. E. Smith and the bequest of Mr. John Drew Salmon.

Herr Buysmann, of Middelburg, Holland, has sent us specimens of dried plants, with the floral and fruit parts dissected and separately mounted. Those parts which would be injured by pressure are placed in alcohol in small flat-sided bottles, so that they can be readily examined with a lens. Small parts of flowers are also mounted in the same way, and where they require a higher power than an ordinary lens they are mounted on glass slides for use with the microscope. Although these specimens are intended primarily as a series of medicinal plants, Herr Buysmann undertakes to prepare, so far as he can, such plants as may be required by subscribers. The series will prove to be of great assistance to teachers of systematic botany.

M. Reverchon is about to undertake a journey to the South of Portugal for the purpose of collecting plants. He undertakes to collect at least 500 species, which will be disposed of to subscribers at 30 *fr.* per century: half the amount to be paid before his departure, which will take place on March 15th. Communications should be addressed to him at Bollène, Vaucluse, France.

Mr. Antony Gepp has been appointed to an Assistantship in the Department of Botany, British Museum.

A SYNOPSIS OF THE *RHIZOCARPEÆ*.

By J. G. Baker, F.R.S., F.L.S.

Suborder 1.—Salvinieæ.

Conceptacles usually single, always membranous and indehiscent, and containing sporangia of only one kind.

1. Salvinia (*Micheli*) Schreb.

Conceptacles globose, membranous, indehiscent, monoicous, seated in clusters on short branches of the floating stem, 1–2 of each cluster containing 10 or more turbinate macrosporangia, each of which contains a single macrospore: several of each cluster containing very numerous globose microsporangia, which are much smaller than the macrosporangia, and each contains numerous minute microspores. — Fugacious annuals, with slender floating stems, giving off shortly-petioled or sessile fronds on the upper side and the short branches, that bear the conceptacles and much-branched feathered root-fibres downwards. Fronds small, simple, with a distinct midrib that runs from the base to the apex, and close erecto-patent secondary veinlets connected by a few arches. Sporangia of both kinds borne on a much-branched filamentous receptacle.

Fronds flat, floating, horizontal.	
Fronds about three times as long as broad .	Sp. 1.
Fronds ovate-oblong, or oblong, or oblong-orbicular	Sp. 2–7.
Fronds orbicular	Sp. 8, 9.
Fronds suberect, with edges folded together . .	Sp. 10, 11.
Imperfectly known species	Sp. 12, 13.

1. S. oblongifolia Mart. Ic. Crypt. Bras. 128, t. 75, fig. 2, and t. 76. — Fronds laxly placed, subsessile, horizontal, oblong, emarginate, cordate at the base, $1\frac{1}{2}$-2 in. long, $\frac{1}{2}$ in. broad, the very numerous veinlets as close as in *S. Radula*, the upper surface with firm papillæ with bristly tips, the lower side finely pubescent. Conceptacles 10–20 together in peduncled clusters, the cells of their walls regularly hexagonal.

Hab. Amazon Valley and Central Brazil, *Martius*, *Pohl*, *St. Hilaire*.

2. S. natans Hoffm. Germ. ii. 1; Schk. Crypt. t. 173; Corda Rhizos. t. 2, figs. 1–11.—*S. verticillata* Roxb. in Calc. Journ. 1845, t. 18-20; Griff. Ic. t. 123–128. — *S. vulgaris* Rupr.— *S. europæa* Desv.— *S. Sprengelii* Corda Rhizos. 10, t. 2, figs. 12–23.— *Marsilea natans* Linn. — Fronds oblong, horizontal, rounded or slightly cordate at the base, $\frac{3}{8}$–$\frac{1}{2}$ in. long, bright green on the upper surface, with about 20 erecto-patent veinlets on each side of the midrib, each beset with 6–8 tufts of minute bristles, the under side thinly

matted like the stem with shining brown pellucid hairs. Conceptacles 4–8 in a cluster, the cells of their walls regularly hexagonal.

Hab. Warm temperate regions of the northern hemisphere of the Old World, extending from the South of France to North China and the Plains of India.

3. S. NIGROPUNCTATA A. Br. in Kuhn Fil. Afric. 201. — Habit entirely of *S. natans*. Fronds oblong, shortly petioled, $\frac{3}{8}$–$\frac{1}{2}$ in. long, rounded or slightly cordate at the base, with 15–20 pairs of erecto-patent veinlets on each side of the midrib, marked with a row of spaced-out blackish dots, without distinct bristly points, the under surface thinly coated with adpressed brown hairs. Fruit unknown.

Hab. Niger Country, gathered by Vogel and Barter. Old Calabar, *Mann*!

4. **S. Hildebrandtii,** n. sp.—Fronds horizontal, sessile, oblong, $\frac{1}{4}$–$\frac{1}{3}$ in. long, $\frac{1}{6}$–$\frac{1}{4}$ in. broad, obtuse, or obscurely emarginate, cordate at the base, flat, distinctly keeled, green and rough with minute concolorous stiff hairs all over the upper surface, brown with matted fibres beneath. Fruit unknown.

Hab. North Madagascar, *Hildebrandt* 3415!

5. S. MOLLIS Mett. in Kuhn Fil. Afric. 231.—Fronds horizontal, oblong, shortly petioled, 8–9 lines long, about $\frac{1}{2}$ in. broad, truncate at the base, very obtuse at the apex, sublobed, densely clothed with short hairs, sparingly with a few longer ones beneath, the close veins anastomosing in several rows of areolæ between the midrib and edge. Fruit unknown.

Hab. Madagascar, *Thouars*.

6. S. HASTATA Desv. in Ann. Linn. Soc. Par. vi. 177. — Fronds laxly disposed, thin, spreading, flat, shortly petioled, ovate-oblong, about $\frac{3}{4}$ in. long, $\frac{1}{3}$–$\frac{1}{2}$ in. broad, slightly cordate at the base, deeply emarginate at the apex, clothed with dense short grey pubescence all over the upper surface, thinly matted with brownish tomentum beneath; veins very numerous, fine, immersed, erecto-patent. Conceptacles not seen.

Hab. Eastern Madagascar, *Baron* 1569! *Humblot* 350!

7. **S. Radula,** n. sp.— Habit of *S. natans*. Fronds horizontal, distinctly petioled, round-oblong, $\frac{1}{2}$–$\frac{5}{8}$ in. long, $\frac{3}{8}$ in. broad, distinctly cordate at the base, with 30–40 close veins on each side of the midrib, the whole upper surface rough with contiguous bristle-tipped papillæ, the lower side only clothed with a few minute fine adpressed hairs. Fruit unknown.

Hab. British Guiana, *Parker*! *Jenman* 1114! Para, *Spruce* 508! Rio Janeiro, *Raddi*! *Burchell* 1580! *Glaziou* 2443! Midway between *natans* and *auriculata*.

8. **S. minima,** n. sp. — Habit of *S. natans*. Fronds orbicular, nearly sessile, $\frac{1}{6}$ in. diam., rounded or slightly cordate at the base, with about 10 erecto-patent veinlets on each side of the midrib, each beset with 5–6 tufts of minute bristles, the under surface brownish, and matted with shining pellucid hairs. Fruit unknown.

Hab. Santa Catherina, South Brazil, *Dr. Fritz Muller* 479!

9. S. AURICULATA Aublet Guian. ii. 969, t. 367. — *S. rotundifolia* Willd.; Raddi Fil. Bras. t. 1. — *S. hispida* H. B. K. — *S. biloba* Raddi Fil. Bras. 1, t. 1. — Fronds firmer in texture than in *S. natans*, orbicular, deeply cordate at the base, ¾ in. broad, the veinlets very close, 40–50 on each side of the midrib, the upper surface covered all over with crested papillæ, which towards the centre of the leaf are lengthened out into prolonged pellucid subulate processes of empty cells, the under surface only thinly pubescent. Conceptacles 4–8 in a cluster, the walls of their cells very flexuose.

Var. *S. Olfersiana* Klotzsch. — Fronds tightly packed, sessile, ⅓ in. diam., with 20–30 veinlets on a side.

Hab. Tropical America, from Cuba to South Brazil. — Var. *Olfersiana*. French Guiana, *Poiteau*! *Sagot* 745! South Brazil, *Olfers*! Paraguay, *Balansa* 1123! *S. affinis* Desv. in Ann. Linn. Soc. Par. vi. 177, probably belongs here.

10. S. SPRUCEI Kuhn in Fl. Bras. i. 655, tab. 81, figs. 11–13.— Fronds crowded, subsessile, orbicular-cuneate, suberect, cucullate, ¼ in. broad, glabrous on both sides when mature; veins distinct, erecto-patent, anastomosing very little. Conceptacles not clustered.

Hab. Amazon Valley, at Solimoes-gapo, *Spruce* 1636 (mixed with a small ferm of *S. auriculata*).

11. S. CUCULLATA Roxb. Fl. Ind. edit. Clarke 547; Wall. Cat. No. 399.— Fronds sessile, so tightly packed on the stems that they are nearly or quite erect, with inflexed borders, broader ($\frac{1}{2}$–$\frac{5}{8}$ in. broad) than long, broadly cuneate or cordate at the base, the veining laxer and more flabellate than in the other species; veinlets 10–12 on each side of the midrib, with 5–6 hexagonal cells in a row between them; papillæ of upper surface very minute and close; under surface nearly naked. Fruit not seen.

Hab. Tanks of the Plains of India. Swan River, *Drummond* 352!

12. S. NYMPHELLULA Desv. in Ann. Linn. Soc. Par. vi. 177.— Fronds suborbicular, cordate, rugoso-pilose above, sericeo-pilose beneath; petiole wedge-shaped.

Hab. West Africa.

13. S. ADNATA Desv. *loc. cit.* — Fronds sessile, adnate, broadly subcuneate, 4–5 lines long, densely fasciculato-pilose above, glabrous beneath.

Hab. Islands of East Africa.

EXCLUDED SPECIES.

S. LÆVIGATA Willd. Sp. Pl. v. 537, proves to be *Trianæa bogotensis* Karst.; Regel Gartenflora, t. 980; in *Hydrocharidaceæ*.

2. AZOLLA Lam.*

Conceptacles of two kinds, placed in the axils of the leaves of the same plant, both indehiscent, one larger, membranous, globose,

* See Mettenius in 'Linnæa,' xx. 259, figs. 2—3, and 'Plantæ Tinneanæ,' p. 51, tab. 25; Griffith's 'Icones,' tabs. 119—123; and Strasburger's elaborate monograph, 'Ueber Azolla,' 86 pages 8vo, with 7 plates, Jena, 1873.

containing numerous microspores, which are aggregated in massulæ which are furnished with a membranous cuticle, and are borne on a branched filiform receptacle; the other kind smaller, ovoid, containing a single macrospore, which is crowned by few or many float-corpuscles, and has a calyptrate cap which is pushed off as the archegonium developes.—Fugacious floating water-plants with copiously-branched stems; leaves sessile, minute, densely imbricated, deeply-lobed, each lobe furnished with a midrib only; the stems sending out from the under side into the water copious simple or feathered solitary or fascicled root-fibres.

Subgenus Euazolla Meyen.—Macrospores crowned with 3 float-corpuscles. Massulæ of the microspores armed all round with rigid glochidiate processes. Root-fibres solitary. . . Sp. 1–3.

Subgenus Rhizosperma Meyen. — Macrospores crowned with numerous float-corpuscles. Massulæ of the microspores armed on one side with a few weak prickles without glochidiate tips. Root-fibres fascicled.

Leafy fronds single and crowded . . . . Sp. 4.
Leafy fronds placed on a wide-trailing leafless stem Sp. 5.

1. A. filiculoides Lam. Encyc. i. 343; Kuhn in Fl. Bras. i. 658, tab. 82, figs. 9–11. — *A. magellanica* Willd. — *A. Arbuscula* Desv.—Fronds 1–2 in. long, copiously bipinnate. Leaves green or oftan tinted with red-brown, the larger lobe ovate. Macrospore with 3 float-corpuscles, its cuticle furnished with large discoid tubercles with deep pits between. Massulæ of microspores furnished with copious rigid processes, without septa, with a glochidiate tip.

Hab. South America, mainly on the west side, ascending in the Andes to 16,000 ft. The alpine forms are dwarf, with nearly orbicular leaf-lobes.

2. A. rubra R. Br. Prodr. 167. — Fronds deltoid, ½–1 in. long, copiously bipinnate. Leaves of firm texture, red-brown, broad ovate, always very obtuse. Macrospore like that of *A. filiculoides*. Massulæ covered with copious septate glochidiate processes.

Hab. Australia and New Zealand.

3. A. caroliniana Willd. Sp. Plant. v. 541; Kuhn in Fl. Bras. i. 659, tab. 82, figs. 1–6. — *A. microphylla* Kaulf.; Mart. Ic. Crypt. t. 74–75.—*A. densa* Desv.— *A. mexicana* Schlecht.—*A. portoricensis* Spreng. — *A. bonariensis* Bertol. — Fronds not more than ½–1 in. long, more deltoid and less copiously bipinnate than in *A. filiculoides*, the branching less racemose. Leaves of softer texture, penerally pale green, smaller, the large lobes more rhomboid-oblong, always obtuse. Macrospore with 3 float-corpuscles, its cuticle finely granulated. Massulæ of the microspores with copious septate rigid processes, with a glochidiate tip.

Hab. Southern United States and California, through Tropical America to Buenos Ayres.

4. A. pinnata R. Br. in Flind. Voy. ii. 611, t. 10. — Root-fibres fascicled and conspicuously feathered. Fronds oblong or deltoid,

$\frac{1}{2}$–1 in. long, with numerous crowded primary branches, all simple or the longest with a few crowded branches towards the tip. Leaf-lobes firm in texture, red-brown, broad ovate. Macrospore crowned with numerous float-corpuscles, its cuticle finely granular, armed with a few clavate papillæ. Massulæ of microspores with only a few weak processes on one side.

Var. *A. africana* Desv. — *A. guineensis* Schum. — *A. decomposita* Zoll. — *A. japonica* Franch. & Savat. — *Salvinia imbricata* Roxb.— Fronds smaller, deltoid, with fewer more distant, more compound branches.

Hab. The type in Australia; the variety, which approximates in habit towards *A. caroliniana*, widely spread in Tropical Asia and Africa.

5. A. NILOTICA Decaisne; Metten. in Plant. Tinn. 51, t. 25.— Decompound deltoid leafy fronds placed on a branched wide-trailing leafless stem, with dense fascicles of root-fibres from its nodes. Leaf lobes ovate, often acute, conspicuously pilose. Macrospore crowned with many float-corpuscles, its cuticle finely granulated and beset with a few clavate papillæ. Massulæ like those of *A. pinnata*, but only two, not many, in a microsporange.

Hab. Nile-country and Zambesi-land. Totally different in general habit from the other species.

(To be continued.)

JOHN ZIER, F.L.S.

By James Britten, F.L.S.

The plants collected by Archibald Menzies and communicated to him by others, which were not incorporated in his arranged herbarium,* remained in the hands of his representatives till some fifteen years ago, when they were presented to the New College, Edinburgh, for the use of the Class of Natural History. An enquiry as to a plant collected by Menzies, which was not in the series presented by him to Sir. J. Banks, recalled to Mr. Carruthers the disposition of these plants; and on a recent visit to Edinburgh, he, by the kindness of Professor Duns, had the opportunity of examining them. More recently, through the friendly intervention of the same gentleman, the Senatus of the College assented to their acquirement by the British Museum, in exchange for a collection of British plants. With the specimens was enclosed a parcel of MSS., consisting of notes on and descriptions of mosses, lichens and fungi, sent to Menzies by John Zier, whose name, save in connection with the genus *Zieria*, is probably known to very few

---

* This was bequeathed by Menzies to the Edinburgh Botanic Garden, where, Dr. Macfarlane kindly informs me, it is still preserved. It consists chiefly of Cryptogams, *Gramineæ*, and *Cyperaceæ*, arranged on sheets of an 8vo size, the names being written in pencil on the lower corner of each sheet, and the localities in ink on the outside upper corner.

botanists. By his contemporaries, however, he seems to have been both known and esteemed, and it may be worth while to print what I have been able to find out about him.

John Zier was a Pole by birth. He was elected F.L.S. on March 18th, 1788 (the second meeting of the Society), being then living in Castle Street, Leicester Fields, London; he subsequently resided in Pimlico. The chief interest about him seems to centre in the fact that he was considered, by those who knew him, to have received but scanty justice from those whose reputations he helped to establish. Thus, in dedicating to him the genus which now bears his name, Smith writes, "In memoriam pie defuncti Johannis Zier, Soc. Linn. quondam Sodalis, botanici indefessi, nobis non obliviscendi quamvis alio sub nomine labores ejus sæpius inclaruerint."* And in the 'Botanists' Repository,' t. 606 (1810), we read, "Were celebrity only to be gained by real merit, many of the high-sounding names that now swell the trump of fame would, we fear, have far less pretensions than Zier." This note was written by George Jackson, who probably spoke with feeling, inasmuch as he seems to have been similarly treated; a notice of Jackson will, I hope, shortly follow the present paper. Sims† speaks of Zier as "our late friend Mr. Zier, a learned and industrious botanist, who, having been appointed to the professorship in a Polish university, was preparing to leave this country, but was prevented by a chronic disease which terminated in death." Commenting on this notice, Smith gives a little personal sketch of Zier, and at the same time supplies a clue to the hint which he had given when founding the genus. Under *Zieria* in Rees's 'Cyclopædia' (1819), he says, "That Mr. Zier was a 'learned and industrious botanist' we are most ready to confirm by our own testimony. He was no less meritorious in his private character, and bore with modesty and patience those privations which too often belong to literary merit in a foreign country, especially where canting and time-serving are out of the question. We have been informed that Mr. Zier was the coadjutor of Mr. William Curtis in part, at least, of the celebrated 'Flora Londinensis,' taking upon himself the technical Latin descriptions, while Mr. Curtis was engaged in those practical observations, experiments, and scientific distinctions, which make the peculiar merit of the work. Mr. Zier died about the year 1796, perhaps rather earlier, at no advanced period of life."

This suggestion of Smith's, so far as I can ascertain, is in no way borne out by any internal evidence afforded by the 'Flora Londinensis,' nor is anything in support of it to be gathered from the biographies of Curtis in Gent. Mag. 1799, in memoirs by his son Samuel, prefixed to the 'General Indexes' to the first 53 volumes of Bot. Mag., in Thornton's 'Sketch of Curtis's Life and Writings,' or in Smith's biography of him in Rees's 'Cyclopædia,' The last-named, however, is by no means friendly in tone; a fact explained by the feeling existing between Smith and Curtis with

* Trans. Linn. Soc. iv. 316 (read Feb. 16, 1798). † Bot. Mag. t. 1395 (1811).

regard to the 'English Botany' of the former, which Samuel Curtis says was brought out in opposition to Mr. Curtis's 'Flora Londinensis' adding, "This unexpected opposition from supposed friends caused Mr. Curtis much uneasiness.'* Smith's account of the misunderstanding is given in the preface to 'English Botany,' vol. vii. (dated 1797). Speaking of the 'Flora Londinensis' he says, "It is not without concern that we have found the Editor of that truly valuable work has taken offence at this publication, as clashing with his, which was by no means our aim or desire. On the contrary, I no sooner heard of his displeasure than I told him, 'if he thought the book likely at all to interfere with the success of his 'Flora,' we would confine it to such plants as were not found within ten miles of London,'† the limits he had originally prescribed to himself. His answer was that 'he should ever consider our undertaking in any form as in all respects hostile to his,' an answer we received with regret, having till then kept up a most friendly botanical intercourse with him; and I record it now merely that the public may understand the real state of the case."

It is, of course, impossible to form a clear opinion as to the merits of the case; but the insinuation of Zier's connection with the 'Flora Londinensis' shows no friendly feeling on the part of Smith.

But if there was no foundation for this insinuation, was there any ground for that made by Smith in 1798, and repeated by George Jackson in 1819? Undoubtedly there was; and it is this which is established by the MSS. mentioned at the beginning of this notice. George Don,‡ when describing *Zieria*, mentions "Mr. John Zier, a learned and industrious Polish botanist, *who assisted Mr. Dickson in his 'Cryptogamia'*"; and an examination of Zier's MSS., in which Mr. Carruthers has kindly assisted me, has convinced us both that the descriptions in Dickson's 'Fasciculi' (1785–1801) were in great part, written by Zier. That these MSS. are no transcripts, but the original descriptions subsequently corrected for the press, is manifest on a comparison of them with the printed book. Zier's work may thus be traced in the mosses and lichens throughout the four fascicles. There is besides, much unpublished matter, with descriptions of species believed by Zier to be new, many of them taken from specimens in Dickson's Herbarium, and so indicated: thus, "*Lichen junceus* M. . . . . Hospitatur in Hbario. D — ni." Dickson makes no reference to having received any help in his work; but besides this aid from Zier, he was assisted by Robert Brown.§ If any doubt remained as to Zier's connection

---

* 'Memoirs,' p. xii.

† Writing to Goodenough, Nov. 9, 1797, Smith says "I am very glad *now* Curtis did not accept my offer, though I would then steadily have kept to it." Memoir, i. 535.

‡ Gen. Syst. i. 794 (1831).

§ "The fourth fasciculus of Dickson's 'Plantæ Cryptogamicæ,' but not, I believe, the third, was largely indebted to [Brown]; but it would be difficult, if not impossible, to determine what portions of the text were actually furnished by him" (Bennett's Preface to Miscell. Works of R. Brown, II. v.).

with the work, it would be removed by his note on a plant which he at first thought new and named *Lichen involutus*, but subsequently identified with *L. marmoreus* Hoffm.: "Sic. observavi Lichenum a D — o mihi, pro fascic. suo 2do. describendi causa, datū."

The references to Zier in contemporary literature, other than those quoted, are few.* He is mentioned in 'Hortus Kewensis' (ed. 2, iv. 75), as having introduced *Rapistrum ægyptiacum* to cultivation in 1787; and he was one of the "number of naturalists present at the detection" of the pretended *Ranunculus bellidiflorus*, which had been sent to Banks "by a naturalist in Germany," and appended his signature, "John Zier" to the drawing then made of the plant.† His MSS., consisting entirely of botanical descriptions, throw little light on his history; but of one plant ("*Lichen tuberculosus*") he says, "Inveni hunc L. in quercu prope radicem prope pagum inter Kew et Hounsley [Hounslow]"; and of another ("*Lichen rubiginosus* Msc. M."), "In Germania legi circa Hanoveram in consortio Ehrharti, qui nomen Byssi ferruginei ei imposuit." Other references in his MSS. show that he was on terms of intimate friendship with Ehrhart; also that he had a herbarium and collected at Hampstead (1788) and in the Isle of Wight, as well as in Germany in 1785. How Menzies became possessed of his MSS. is not clear, but they doubtless came into his possession at the death of Zier.

ON THE FLORA OF THE UPPER TAMAR AND NEIGHBOURING DISTRICTS.

By the Rev. W. Moyle Rogers, F.L.S.

(Continued from p.).

Epilobium angustifolium L. I. Boscastle (Hind). ? Garden escape. Not otherwise recorded for Cornwall. — *E. hirsutum* L. Local and uncommon, except in District I.—*E. parviflorum* Schreb. —*E. hirsuto-parviflorum* Schur. Hybrid. II. Roadside-ditch near Newacott, several together. — *E. montanum* L. — *E. tetragonum* L. I. and II. Fairly common. III. Between Bridgerule Church and Bridge Moor. Dux Common. Between Tinney and N. Tamerton. — *E. obscurum* Schreb. — *E. palustre* L. Remarkably common.— *E. parviflora-palustre* Hmp. Hybrid. Locally abundant. II. and III. Bridgerule, roadside-ditches.

Circæa lutetiana L.

Myriophyllum spicatum L. I. "Bude Canal, &c." (Hind). ? The

---

* Hugh Davies, writing to Smith in March, 1793, says "I am much affected at your account of Mr. Hudson and Mr. Zier" (Smith's 'Memoir and Correspondence,' i. 434). Unfortunately Smith's letter, to which this is a reply, is not given.

† Ann. Bot. i. 373.

segregate. — *M. alterniflorum* DC. III. Canal near Reservoir, and near Holsworthy. IV. In the Waldon, near Bradworthy, abundant. A *Myriophyllum* also occurs in plenty on Greena Moor (I.), in the canal at Bridgerule (II.) in immense quantity, and at Tetcott (III.); but, as I have failed to find it in flower or fruit in all these places, I cannot say whether it is *spicatum* or *alterniflorum*.

Callitriche stagnalis Scop. (aggregate). — *C. hamulata* Kirtz. II. In the Canal, where it issues from the Reservoir. — b. *pedunculata*. III. Ditches between Bridgerule and Dux Common, in plenty.

Bryonia dioica L. I. Hedge in lane near Poughill or Marhamchurch (Webb). Probably a casual. I have never seen it in Cornwall, and only once in Devon, on a garden-wall at Teignmouth.

Ribes rubrum L. III. Southlands Plantation, in fair quantity; denizen.

Sedum Telephium L. I. Boscastle (Hind). Valley of Rocks, and (in considerable quantity) near St. Knighton's Kieve; perhaps native. II. Whitstone, roadside not far from cottage. III. N. Tamerton, hedge near the village. All *purpurascens*, I think. — *S. anglicum* Huds. I. Abundant by the sea. IV. Rocks, Okehampton. — *S. acre* L. I. Frequent on the coast. Inland I have seen this species (as also *S. reflexum* L.) only where its presence seemed due to man's agency.

Sempervivum tectorum L. Where planted, frequent.

Cotyledon Umbilicus L.

Saxifraga tridactylites L. I. Marhamchurch Village.

Chrysosplenium oppositifolium L. Rather local. I. Stratton, stream-bed, in great quantity. Wanson stream-bed. St. Knighton's Kieve. Boscastle and Minster Valley, in plenty. Valley of Rocks. III. Between Dux Common and Pyworthy Village. Holsworthy and Bridgerule Road, in two places.

Hydrocotyle vulgaris L.

Sanicula europæa L.

Eryngium maritimum L. I. Bude (Hind!). Widmouth.

Apium graveolens L. I. Common near the sea.

Helosciadium nodiflorum Koch. — *H. repens* Koch. I. Bude (Hind).

Petroselinum sativum Hoffm. I. "Bude, &c." (Hind). Boscastle, on walls and rock (with *Lepidium sativum*), but not far from kitchen garden. — *P. segetum* Koch. Very rare. I. Poughill (Hind). Between Bude and Stratton.

Sison Amomum L. I. In the Bude, Stratton, and Marhamchurch neighbourhood, frequent; but not seen elsewhere.

Ægopodium Podagraria L. A fairly common denizen in all the districts.

Carum verticillatum Koch. I. Week St. Mary (Hind, 1873!), in hollow east of the village. Tackbeare; and beyond, towards Widmouth. II. Tamar Valley, in several places. Wilsworthy Moor. III. Bridgerule, 1882, and in nearly all wet moory places between the Tamar and Holsworthy, very common. IV. Ugworthy Moor. Marshy ground about four miles from Bradworthy, on the

Holsworthy Road. Not seen in the higher moorland tract between Holsworthy and Okehampton.

Bunium flexuosum With.

Pimpinella Saxifraga L. Generally distributed, but hardly a common plant in District III.

Œnanthe Lachenalii Gmel. I. Bude (Hind!), on Summerleaze Down.—*Œ. crocata* L.

Æthusa Cynapium L.

Crithmum maritimum L. I. Sea-coast from Sandymouth to Tintagel, frequent.

Angelica sylvestris L.

Pastinaca sativa L. I. Near Northcot Mouth (Hind). Near the coast at Bude (Baker). I have not seen this, except in spots where it seemed to me to have escaped from cultivation.

Heracleum Sphondylium L.

Daucus Carota L. — *D. gummifer* Lam. "Frequent on coast" (Hind).

Torilis Anthriscus Gaert. — *T. nodosa* Gaert. I. From Sandymouth and Kilkhampton to Trebarwith; fairly frequent in dry sunny spots, especially near the sea. II. In very small quantity at Littlebridge, and by Sanctuaries Farm House. III. and IV. Not seen.

Chærophyllum sylvestre L.—*C. temulum* L.

Scandix Pecten-Veneris L.

Conium maculatum L. Local. I. Bude (Hind!). Marhamchurch. Boscastle and neighbourhood, abundant. III. Bridgerule. IV. Okehampton.

Smyrnium Olusatrum L. I. Between Stibb and Kilkhampton (Mrs. Kennedy), and thence along the coast to Trebarwith, rather frequent, and in some places possibly native. Inland I have noted several localities for it in all the districts, but only such as former cultivation would account for.

Hedera Helix L.

Sambucus niger L.

Viburnum Opulus L.

Lonicera Periclymenum L.

Rubia peregrina L. I. Poughill (Hind), and thence along the coast to Trebarwith, frequent. Hoppicott Down. Between Titson and Wainhouse Corner.

Galium verum L. I. Frequent, but only quite near the sea. — *G. Mollugo* L. Remarkably local, and so far from supporting the statement in Keys' 'Flora of Devon and Cornwall,' "abundant in every hedge in both counties." I. Between Stratton and Bridgerule, in several spots. Near Marhamchurch (Hind!), in two places. Week St. Mary. Boscastle to Trebarwith, frequent. II. Launceston and Kilkhampton Road:—between Grimscott and Kilkhampton, a few plants; then for a short distance south of Butsburrow Cross; again, occasionally, south of Whitstone; becoming common near Launceston. In one spot between Bridgerule Village and Newacott. III. Bridgerule and Holsworthy Road, in one spot beyond Dux Common, north side, a few plants. N. Tamerton,

roadside north of the village for some yards. Lifton and Bridestowe Road, common. IV. Apparently absent from the Waldon district, and very rare between the Tamar and Okehampton (by Holsworthy). Common about Okehampton. — *G. saxatile* L. — *G. sylvestre* Poll. I. Efford Down, among furze, in small quantity, 1882. I saw it there again in 1883 and 1885, but have failed to find it elsewhere along the coast. Mentioned in Keys' 'Flora of Devon and Cornwall' as "formerly reported for the county" (*i. e.*, Cornwall), but without locality named. Unknown in Devon. — *G. palustre* L. Common, the var. *elongatum* prevailing, although *Withering ii* also occurs in many places. — *G. uliginosum* L. I. Greena Moor. II. Near Merrifield. III. Bridgerule, 1882, and Tinney, frequent. IV. Near Bradworthy, on the Holsworthy Road.—*G. Aparine* L.

Asperula odorata L. Denizen. III. Plantations at Parnacott and Bridgerule Vicarage, in great quantity.

Sherardia arvensis L.

Centranthus ruber DC. I. Alien. Stratton and Boscastle (Hind!).

Valeriana officinalis L. — a. *Mikanii*. I. Kilkhampton. III. Bridgerule, frequent. — b. *sambucifolia*. Very common.

Valerianella olitoria Mœnch. Apparently quite rare. I. Bude. Trebarwith. IV. Okehampton. — *V. Auricula* DC. I. Between Marhamchurch and Burrow. II. Roadside, Merrifield. III. Bridgerule, 1882. — *V. dentata* Koch.

Dipsacus sylvestris L. I. Morwinstow (Hind). Certainly rare. I have not seen it in any of the districts.

Scabiosa Succisa L. — *S. arvensis* L.

Carduus tenuiflorus Curt. I. Kilkhampton (Mrs. Kennedy). Bude. Widmouth. Boscastle. Trebarwith. — *C. nutans* L. I. Fairly common. Not seen at all in the other districts, except near Bridestowe (III.). — *C. lanceolatus* L. — *C. crispus* L. Roadside near Whitstone, I. or II. (Baker). I have failed to find it. — *C. palustris* L.— *C. pratensis* Huds. A frequent and often exceedingly abundant plant in most of the boggy and moorland districts. I. Kilkhampton. Near the Reservoir. Week St. Mary (Hind! First record for Cornwall, 1873). Greena Moor. II. Between Canal and the Tamar, below Bridgerule. III. and IV. So frequent and usually growing in such masses as to be one of the most characteristic plants of the country between the Tamar and Okehampton. First record for N. Devon, Ravenshaw, 'Flowering Plants and Ferns of Devonshire,' 1860 ("Between S. Molton and Bampton," in which locality, on "Baples Hill," I saw it last summer). It is remarkable that in the 1st edition of 'Topographical Botany' (1873) this conspicuous plant should be found unrecorded for Cornwall and queried for N. Devon. — *C. acaulis* L. I. Bude (Hind! 1873), Efford Down. The only Cornish locality known. Still unrecorded for N. Devon, and exceedingly local in S. Devon. — *C. arvensis* Curt.

Carlina vulgaris L. I. From Sandymouth to Trebarwith; frequent, but only near the sea.

Arctium majus Schkuhr. I. "Poughill, &c." (Hind, 1873). Bude, two or three plants. Waste ground below Launcells Church

and in road near, a good many. Burrow. IV. Near Okehampton. — *A. minus* Schkuhr. Rather common. — *A. intermedium* Lange and *A. pubens* Bab. I. "Bude, &c.," Hind. Plants intermediate between *majus* and *minus* (but which I am unable to name more exactly) occur at Kilkhampton and Burrow (with *majus*), I.; in Loudgworthy Lane, Bridgerule, III.; and about Okehampton, IV.

Serratula tinctoria L.

Centaurea nigra L. I consider type and var. *decipiens* (*both* rayed and unrayed) about equally common. — *C. Scabiosa* L. I. Frequent on the coast, at Sandymouth, Bude, &c. II. Bridgerule, rare. Not seen at all in III. and IV. — *C. Cyanus* L. III. Seen only once (1885), in "Bridge Park" field, Bridgerule.

Chrysanthemum segetum L. I. Boscastle (Hind!) and neighbourhood, very abundant. Tintagel, potato-field full. A rare plant in Cornwall and Devon. — *C. Leucanthemum* L.

Matricaria Parthenium L. Denizen. Rare. Launcells, near a farm-house. Boscastle. III. Bridgerule. N. Tamerton. — *M. inodora* L. — c. *maritima*. I. Bude (Hind). I do not understand this var.

Tanacetum vulgare L. I. Morwinstow and Trevenna (Hind). Near Stratton. Whitstone Churchyard and lane. Jacobstow. Boscastle neighbourhood, frequent. Tintagel, &c. Possibly native in some few spots in this district. III. Between Dux Common and Pyworthy. IV. Between Bradworthy and Holsworthy.

Anthemis Cotula L. — *A. nobilis* L. Quite common in I. and II., and fairly so in III.

Achillea Millefolium L. — *A. Ptarmica* L.

Artemisia Absinthium L. Denizen. I. Morwinstow (Mrs. Kennedy). Near Stibb. Bude and Trevenna (Hind). Summerleaze Down, north-east end, in considerable quantity. Pentargan Bay and whole Boscastle neighbourhood, in plenty. III. Between Pancrasweek and Parnacott, near farm, one plant. — *A. vulgaris* L.

Filago germanica L. Rather uncommon. I. "Poughill, &c." (Hind). Boscastle. Trebarwith. II. Bridgerule. III. "Lower Hill Park," Bridgerule. Between Lifton and Bridestowe. IV. Near Okehampton.

Gnaphalium uliginosum L. — *G. sylvaticum* L. In Dr. Hind's list without locality named. "Hitherto unrecorded for Cornwall, and very rare in Devon," Briggs. I may add that the few Devon localities recorded are all in S. Devon.

Senecio vulgaris L. — *S. sylvaticus* L. Common enough in its special habitats. — *S. erucifolius* L. Very local, except near the sea. I. From Sandymonth to Widmouth, frequent. Stratton. Launcells. II. Bridgerule, by canal. III. Lifton and thence towards Lew Down, in plenty.—*S. Jacobæa* L.—*S. aquaticus* Huds.

Bidens tripartita L. I. Bude (Hind!). Whitstone, in two places (Baker!). Wainhouse Corner. II. Near Kilkhampton. Near Grimscott. Littlebridge and Bridgerule (four places). III. At Derrill Cross. Near Holsworthy (Bude Road). Near Ford Mill. Bridgerule Mill. Tatson. N. Tamerton. Tetcott. Seldom more than two or three plants together; but in considerable quantity between Tinney and the Tamar.

Inula crithmoides L. I. Cliffs at Boscastle, and at the mouth of the Valley of Rocks. "Picked up at Tintagel, recently gathered" (Hind). — *I. dysenterica* L.

Bellis perennis L.

Erigeron acris L. I. Summerleaze Down, 1883.

Aster Tripolium L. I. "Plentiful by the stream at Bude" (Baker!).

Solidago Virga-aurea L.

Tussilago Farfara L.

Petasites vulgaris Desf. I. Orchard near the Parsonage, Kilkhampton (Mrs. Kennedy). Langford Hill Plantation. IV. Bradworthy, old garden.

Eupatorium cannabinum L.

Cichorium Intybus L. Very local. I. Bude (Miss Harrison, 1850, in Keys' Fl. Dev. and Cornw.); frequent, especially towards Marhamchurch, Stratton, and Launcells. Also a few plants together (often only one or two) at Burrow, near Red Post, near Wanson Mouth, and at Week St. Mary. II. Between Gilbert's Cross and Burrow Cross. Littlebridge. About Newacott. III. Bridgerule, roadside near the church. Perhaps only as a casual in II. and III.

Lapsana communis L.

Hypochæris glabra L. I. Bude (Mrs. Kennedy). Not otherwise known as Cornish. The locality is a likely one; having myself found this species in plenty on Braunton Burrows, I searched the Bude sand-hills for it, but, I am bound to add, without success.— *H. radicata* L.

Leontodon hirtus L. — *L. hispidus* L. I. Poughill (Hind). II. Hill between Werrington and St. Stephen's, abundant. III. Bridgerule, roadside bank near Vicarage, one plant, 1882, casual. Between Lifton and Okehampton, frequent. IV. In plenty on moors between Beaworthy and Ashbury, and about Okehampton.— *L. autumnalis* L.

Helminthia echioides Gaert. I. Frequent from Sandymouth to Widmouth, and inland to Burrow; but not seen in the Boscastle and Tintagel neighbourhood. III. In clayey ditches between Bridgerule Church and Bridge Moor, a few plants; an unusually bare and exposed locality for it. Near Holsworthy, on the Bude Road.

Taraxacum officinale Wigg.—a. *Dens-leonis* and d. *palustre*. Common. — b. *erythrospermum*. I. On rocks, Boscastle.

Sonchus oleraceus L. — *S. asper* Hoffm. — *S. arvensis* L.

Crepis taraxacifolia Thuil. Colonist. I. Locally abundant. Near Bude and Stratton, and Burrow, in great quantity. About Boscastle, especially in grass-field above hotel. III. Bridgerule, in several places, but no great quantity. Near Holsworthy. — *C. biennis* L. Casual. I. Near Stratton, one plant, 1882. — *C. virens* L.

Hieracium Pilosella L. — *H. aurantiacum* L. Alien. I. Whitstone Churchyard, in plenty. — *H. umbellatum* L. — ["*H. corymbosum* Fr.? Kilkhampton," Hind. Probably *umbellatum*, in Mr. Baker's opinion]. — *H. boreale* Fries. II. Near Kilkhampton, at

about half a mile on the Grimscott Road, for some distance, but in no great quantity. The only locality where I have seen it, and probably the same as Dr. Hind gives doubtfully for this species.

Jasione montana L.

Wahlenbergia hederacea Reich. Very local. I. Minster Valley, in plenty. IV. Near Beaworthy. Moorland pasture, near Ashbury. Near Okehampton.

Vaccinium Myrtillus L. Remarkably uncommon. I. Launcells, lane north of Vicarage. Week St. Mary (Hind). Minster Valley. IV. Okehampton.

Erica Tetralix L.—*E. cinerea* L.

Calluna vulgaris Salisb.

Fraxinus excelsior L.

Ligustrum vulgare L. Common, and I think undoubtedly native, in all the districts.

Vinca minor L. III. Parnacott and Bridgerule; no doubt planted. Pyworthy, wood on Holsworthy Road, possibly native.

Erythræa Centaurium Pers. — b. *pseudo-latifolia*. I. Sandymouth. Bude. Boscastle. — *E. pulchella* Fries. I. Bude (Miss Harrison, 1850, in Keys' Fl. Dev. and Cornw., Hind)!; on both Summerleaze and Efford Downs, locally abundant. Field near Hoppicott Down. Widmouth. Wanson Mouth. Not seen in the other districts.

Cicendia filiformis Delarbre. III. Affaland Moor (near Ford Mill), south-west corner, sparingly; and for a short distance in roadside ditch between the moor and Pyworthy village, 1883 and 1885. An especially interesting discovery of Mr. Briggs', as there appears to be no other Devon locality on record, although the county has long been credited with the possession of this species (see Fl. Dev. and Mr. Ravenshaw's List).

Chlora perfoliata L. I. About Bude, locally abundant. Between Stratton and Red Post, in several spots, and especially in great quantity in a field near Hoppicott Down ("Between Stratton and Launceston," Mr. F. P. Balkwill, 1862, in Keys' Fl. Dev. and Cornw.). Otherwise unknown for Cornwall.

Gentiana Amarella L. Seen only in one locality. I. Efford Down, Bude. Rare in the extreme south-west, and without personal authority for E. Cornwall in Top. Bot. — *G. campestris* L. Nearly as rare as *Amarella*. I. Greena Moor. Boscastle (Hind).

Menyanthes trifoliata L. One of the commonest bog plants in all the districts.

Convolvulus arvensis L. Remarkably rare. I. Bude (Hind); on the road thence to Marhamchurch. III. Bridgerule.—*C. sepium* L. —*C. Soldanella* L. I. Bude (Hind)! and Widmouth.

Cuscuta Epithymum Murr. I. From Sandymouth to Bude, frequent ("Bude, &c." Hind). Not seen inland.

Solanum Dulcamara L. — *S. nigrum* L. Rare. I. Bude (Miss Harrison in Keys' Fl. Dev. and Cornw., Hind). III. Bridgerule, garden weed at Vicarage in 1885.

(To be continued.)

SHORT NOTES.

Rosa Ripartii Déséglise, in Britain.—In looking through my herbarium for notes and localities of Surrey roses for Mr. W. H. Beeby's forthcoming Flora, I came across a form of *R. spinosissima* collected on Barnes Common in July, 1878; this I had provisionally labelled *R. Ripartii* Déségl.? As my attention has to a considerable extent been diverted from British Roses since that period, no definite attempt was made to settle the doubt. Now, however, thanks to the kindness of Messrs. H. and J. Groves, who have lent me specimens of *R. Ripartii* collected in the departments of Cher and Loire Inférieure by Déséglise and Lloyd respectively, I have been able to prove the identity of the British with the continental plant. Mr. Baker, in his 'Monograph of British Roses' (Journ. Linn. Soc. (Bot.) xi. 202), says of *R. spinosissima*, "Though it varies much according to its place of growth in luxuriance and the density of its prickles, we do not appear to have in Britain any striking variety. With us the form with a naked peduncle is much the most common; that with an aciculate peduncle quite rare." Then, among the principle European varieties, he commences with *R. Ripartii*, with more decidedly glandular petioles and stipules, and peduncles usually but not always aciculate. Nyman, in his 'Conspectus Floræ Europæ,' places *R. Ripartii* under *R. myriacantha* DC. (which is accorded specific rank), but I follow Mr. Baker in regarding both as mere forms of *R. spinosissima* L. Crépin, in 'Primitiæ Monographiæ Rosarum,' published in 'Bulletin de la Société Royale de botanique de Belgique,' tome viii., p. 262, says, "Par leurs dents composées glanduleuses et leurs nervures secondaires souvent chargées de glandes, les *R. myriacantha* et *R. Ripartii* se distinguent facilement des autres formes." Lloyd ('Flore de l'Ouest,' ed. 2, p. 17), places *R. Ripartii* as variety γ under *R. pimpinellifolia* L., and describes it as follows:—"différent du type par les fol. surdentées à surdents glanduleuses ainsi que la côte des fol. et les stip." The synonymy of this plant is as follows:—

R. Ripartii Déséglise. 'Essai Monogr. in mem. de la Soc. Acad. de M. et L.', x., 1861, p. 87 et extr. p. 47.

R. spinosissima. 'Trattinick, Rosarum Monographia,' ii., 118; Reichenbach, 'Flora Excursoria' (1830) ii., 612; Mutel, 'Flore Française,' i., p. 435.

R. pimpinellifolia γ. Lloyd, 'Flore de l'Ouest de la France' ed. 2 (1861), p. 175.—George Nicholson.

The Labelling of Alien Species.—The record of *Sisymbrium altissimum* L. in Dr. Roth's 'Addimenta ad Consp. Fl. Europ.' (p. 8), as a British plant, suggests the query "How should our alien plants be distinguished on their labels at a glance?" I ask this, because in the above case cited "there is nothing on the label to show but what the species is a native British plant,"—that is, as much as *Bellis perennis*, or any other genuine native. There is nothing to prevent a host of our aliens being so recorded, if they reach continental herbaria, without some mark or sign. It may be said that the knowledge of their distribution elsewhere should

be sufficient, but even M. DeCandolle, as quoted by Mr. H. C. Watson, was not always able to do this, and if not a DeCandolle, others would be much less likely to do so. I am well aware that there are certain species in Nyman given as British species that we do not accept as natives; these, however, will be noticed in a supplement which Dr. Nyman hopes to bring out in 1887.—Arthur Bennett.

Notes on East Norfolk Plants. — The following new stations, and remarks on plants observed in this vice-county during a stay at Happisburgh during the summer of 1885, may be worth recording in the Journal:—

Rubi. — This neighbourhood is evidently worthy of further attention: a few collected in the lanes near Happisburgh have been submitted to Dr. Focke, and named by him as under:—*Rubus discolor* var. *dissectus*. A very striking form, with deeply-cut leaves; not uncommon. Mr. Baker says, "I have never seen anything like it." — *R. vestitus* W. & N. — *R. melanoxylon*, "or near it." (Mr. Baker says, "I think it a form of *R. umbrosus* Arrh.").— *R. dumetorum* var. *ferox* W. & N., *fide* Baker. — *R. hirtifolius*, *fide* Dr. Focke; but Mr. Baker does not agree with this identification.

Heracleum Sphondylium var. *acutifolium*. A marked feature at Happisburgh, nearly as frequent as the common form.

Sambucus Ebulus. Forms hedgerows in the lanes near Happisburgh Lighthouse.

Liparis Loeselii. A new station in the Ranworth District, quite distinct, I believe, from that near the Decoy; very abundant.

Ruscus aculeatus. Hedgebanks between Walcot and Ridlington. A rare plant in the county, according to the Flora.

Potamogeton trichoides. An entirely new station near Lessingham.

Scirpus fluitans. Abundant near Lessingham.

Naias marina. It is satisfactory to record an entirely new station for this interesting plant in the same district, but some miles away from Mr. A. Bennett's locality, which has of late been rather ruthlessly fished. In the new locality many of the plants are very large and fine, from ten to twelve inches high.

A careful search of the coast from Happisburgh southward to Palling, and again from Caistor to Yarmouth, failed to produce *Carex trinervis*.—Henry T. Mennell.

New Glamorgan Plants. — The following were gathered last June, and are all additional to 'Topographical Botany,' ed. 2. The district round Swansea, to which these notes refer, was well worked about forty-seven years ago, and very interesting lists of the plants were published in vol. i. of the 'Phytologist': — *Trifolium filiforme* L., *Fragaria vesca* L., *Callitriche pedunculata* DC., *Helosciadium inundatum* Koch, *Taraxacum lævigatum* DC., *Hieracium pallidum* Fr., *Primula vulgaris* Huds., *Listera ovata* Br., *Scirpus fluitans* L., *Carex paniculata* L., *C. remota* L., *C. ovalis*, Good., *C. Œderi* Ehrh., *Aira caryophyllea* L., *Bromus mollis* L., *Triticum junceum* L. I gathered also a *Juncus supinus* Mœnch., which was 6-stamened, and likely to prove *J. Kochii*. *Cannabis sativa*, and *Phalaris canariensis* were rubbish-heap casuals.—E. F. Linton.

Polypodium Phegopteris in West Sussex. — I have recently received this from the above county, collected by Mrs. R. B. Pratten in a "grassy coombe" about a quarter of a mile from the Surrey border, in the Arun basin. From what I know of the locality, I think it probably native. My informant also reports its occurrence west of Haslemere, but I have not yet been able to ascertain whether this locality is in North Hants or Surrey. There are not a few likely stations for this fern in the southern portion of the Arun district in Surrey.—W. H. Beeby.

Note on Utricularia.—The fruit of the bladderworts is crowned by a long beak, consisting of the persistent style. It affords valuable diagnostic characters. The following observations were made on growing plants in Surrey:—The beak of *U. neglecta* Lehm. *appeared* to be a tube, but, accepting the description of the style as being composed of two plates, the appèarance would be due to the edges of the plates cohering closely. In this case I unfortunately lost the fruits which had been bottled for dissection.—*U. minor* L. In this species the ripe fruit bears a rather long beak, about equal to the diameter of the fruit. Each of the plates tapers upwards and is recurved, so that the beak is bifid, with the lips recurved, lower longest. — *U. neglecta* Lehm. Remarkably different from the last. The plates are not narrowed upwards, and cohere at the edges throughout, so that the "beak" is tubular, somewhat dilated upwards, with a rather wavy and crenulate margin; longer than the diameter of the fruit. I should be much interested to learn what the beak of *U. vulgaris* is like, and to have the opportunity of comparing it with that of *U. neglecta*.—W. H. Beeby.

NEW PHANEROGAMS PUBLISHED IN PERIODICALS IN GREAT BRITAIN AND IRELAND DURING 1885.

The periodicals cited in this list are: 'Botanical Magazine,' 'Gardeners' Chronicle,' 'Icones Plantarum,' 'Journal of Botany,' 'Journal of the Linnean Society of London,' and 'Transactions of the Royal Irish Academy.'

We have also included those published in Mr. H. O. Forbes's 'A Naturalist's Wanderings in the Eastern Archipelago,' as there is some danger of species published in works of this general kind being overlooked. A large number of *nomina nuda* have been put forward in Mr. H. H. Johnston's 'The Kilima-njaro Expedition' (a work falsely dated 1886); but these we of course ignore, as they have no claims to recognition, and their introduction into botanical literature in this form would be reprehensible.

We have added in square brackets the publishers of certain names which are cited from the MS. description or notes of those who stand as the authority for them. New genera are indicated by an affixed asterisk.

Acalypha hologyna *Baker*. Madagascar. Journ. Linn. Soc. xxi. 411.
Actinidia fulvicoma *Hance*. China. Journ. Bot. 321.
Aeranthus Leonis *Rchb. f.* Madagascar. Gard. Chron. xxiii. 726.

AERIDES BALLANTINIANUM *Rchb. f.* Gard. Chron. xxiv. 198.—A. BERNARDIANUM *Rchb. f.* Id. 650.—A. MARGINATUM *Rchb. f.* Id. xxiii. 533.—A. ORTGIESIANUM *Rchb. f.* Id. 501.

ÆTHIONEMA SPICATUM Post. Syria. Ic. Pl. 1478.

AGLÆONEMA ACUTISPATHUM *N. E. Br.* China. Gard. Chron. xxiv. 39.

ALOCASIA SINUATA *N. E. Br.* Malaya. Gard. Chron. xxiv. 678.

ALPINIA ? PUMILA *Hook. f.* China. Bot. Mag. t. 6832.

ALSODEIA DECORA *Trim.* Ceylon. Journ. Bot. 203.

AMOMUM BENTHAMIANUM *Trim.* Ceylon. Journ. Bot. 266.

AMPHORCHIS LILACINA *Ridley.* Madagascar. Journ. Linn. Soc. xxi. 518.

ANEMONE THOMSONI *Oliv.* E. Africa. Journ. Linn. Soc. xxi. 397.

ANGRÆCUM CLAVIGERUM *Ridl.* and A. COWANII *Ridl.* Madagascar. Journ. Linn. Soc. xxi. 484–5.—A. FLORULENTUM *Rchb. f.* Madagascar. Gard. Chron. xxiii. 786.—A. GLOMERATUM *Ridl.* Sierra Leone. Id. xxiv. 678.—A. MAXILLARIOIDES *Ridl.* Madagascar. Journ. Linn. Soc. xxi. 479.—A. ROSTELLARE *Rchb. f.* Madagascar. Gard. Chron. xxiii. 726.—A. ROSTRATUM *Ridl.*, A. SPATHULATUM *Ridl.*, and A. TERETIFOLIUM *Ridl.* Madagascar. Journ. Linn. Soc. xxi. 478–485.

ANISOCHILUS SINENSE *Hance.* China. Journ. Bot. 327.

ANTHEMIS HYDRUNTINA *H. Groves* (*Flor.**). S. Italy. Journ. Linn. Soc. xxi. 533.

ANTHERICUM ECHEANDIOIDES *Baker.* Mexico. Bot. Mag. t. 6809.

ANTHURIUM FLAVIDUM *N. E. Br.* Columbia. Gard. Chron. xxiv. 651.—A. GLAZIOVII *Hook. f.* Brazil. Bot. Mag. t. 6853.—A. INCONSPICUUM *N. E. Br.* Brazil. Gard. Chron. xxiii. 786.

*APODOCEPHALA (Compositæ, Eupatoriaceæ).—A. PAUCIFLORA *Baker*, sp. nnica. Madagascar. Journ. Linn. Soc. xxi. 417.

ARCTOTIS LEICHTLINIANA *Lynch.* Gard. Chron. xxiv. 38.

ARDISIA LONGIPES, A.? MACROSCYPHA, A. MYRIANTHA, A. OLIGANTHA, A. UMBELLATA, all of *Baker.* Madagascar. Journ. Linn. Soc. xxi. 419–21.

ARISTEA ALATA *Baker.* E. Africa. Journ. Linn. Soc. xxi. 405.

ARISTOLOCHIA ELEGANS *Mast.* Brazil. Gard. Chron. xxiv. 301, fig. 64.—A. FORDIANA *Hemsl.*, and A. WESTLANDI *Hemsl.* China. Journ. Bot. 286.

ASTRAGALUS CASAPALTENSIS *Ball.* Peruvian Andes. Journ. Linn. Soc. xxii. 36.

BARKERIA VANNERIANA *Rchb. f.*, "n. sp. (hyb. nat.?)." Gard. Chron. xxiv. 678.

BEGONIELLA ANGUSTIFOLIA *Oliv.* N. Granada. Ic. Pl. 1487.

BICORNELLA PARVIFLORA *Ridley.* Madagascar. Journ. Linn. Soc. xxi. 500, t. xv.

BOUCEROSIA AARONIS *Hart.* Palestine. Trans. R. Irish Acad. xxviii. 436, t. 17.

BRASSIA ELEGANTULA *Rchb. f.* Mexico. Gard. Chron. xxiv. 616.

BRIDELIA COCCOLOBÆFOLIA *Baker.* Madagascar. Journ. Linn. Soc. xxi. 441.

---

* It seems necessary to add this abbreviation (of *Florentiæ*) to distinguish Mr. Henry Groves of Florence from his namesake of London.

BROMUS FRIGIDUS *Ball.* Peruvian Andes. Journ. Linn. Soc. xxii. 63.
BRUGMANSIA, n. sp. Sumatra. Nat. Wand. 206 (figured, but not named or described.)
BUCHNERA EXSERTA *Fawcett*, and B. TIMORENSIS *Fawc.* Timor. Nat. Wand. 512.
BUDDLEIA SPHÆROCEPHALA *Baker.* Madagascar. Journ. Linn. Soc. xxi. 425.
BULBOPHYLLUM BARONII *Ridley.* Madagascar. Journ. Linn. Soc. xxi. 463.—B. CRASSIFOLIUM *Thw. MS.* [*Trim.*]. Ceylon. Journ. Bot. 244. — B. MULTIFLORA, B. OCCLUSUM, B. THOMPSONII, all of *Ridley.* Madagascar. Journ. Linn. Soc. xxi. 463–64.
CALADENIA JAVANICA *Benn. MSS.* (*Ridl.*). Timor. Nat. Wand. 518,
CALAMUS NIVALIS *Thw. MS.* [*Trim.*] and C. OVOIDEUS *Thw. MS.* [*Trim.*]. Ceylon. Journ. Bot. 268, 269.
CALANTHE COLORANS *Rchb. f.* Gard. Chron. xxiv. 360.
CALLILEPIS SALICIFOLIA *Oliv.* S. Africa. Ic. Pl. 1482.
CAREX BARONI *Baker.* Madagascar. Journ. Linn. Soc. xxi. 451.—C. TARTAREA *Ridl.* Sumatra. Journ. Bot. 35.
CASEARIA SUBRHOMBEA *Hance.* China. Journ. Bot. 323.
CATASETUM GLAUCOGLOSSUM *Rchb. f.*, "n. typ." Mexico. Gard. Chron. xxiv. 552.
CATTLEYA LAWRENCEANA *Rchb. f.* British Guiana. Gard. Chron. xxiii. 338.
CELASTRUS CANTONENSIS *Hance.* China. Journ. Bot. 323.
CEROPEGIA OBTUSILOBA *Fawc.* Timor. Nat. Wand. 511. — C. TRICHANTHA *Hemsl.* China. Journ Bot. 286.
CHÆTACME MADAGASCARIENSIS *Baker.* Madagascar. Trans. Linn. xxi. 443.
CHÆTOTROPIS ANDINA *Ball.* Peruvian Andes. Journ. Linn. Soc. xxii. 58.
CHAILLETIA HAINANENSIS *Hance.* China. Journ. Bot. 322.
CLADIUM ENSIGERUM *Hance.* Hong Kong. Journ. Bot. 80. — C. MELLERI and C. PANTOPODUM *Baker.* Madagascar. Journ. Linn. Soc. xxi. 451.
CHLOROPHYTUM RHIZOMATOSUM *Baker.* Zanzibar. Gard. Chron. xxiv. 230.
CHRISTISONIA THWAITESII *Trim.* Ceylon. Journ. Bot. 240.
CLEISOSTOMA THWAITESIANUM *Trim.* Ceylon. Journ. Bot. 244.
CLERODENDRON ? BRUNSVIGIOIDES *Baker.* Madagascar. Journ. Linn. Soc. xxi. 435.—C. PULCHRUM *Fawc.* Timor. Nat. Wand. 514.
CŒLOGYNE LACTEA *Rchb. f.* Gard. Chron. xxiii. 692.
COLEA PARVIFLORA *Baker.* Madagascar. Journ. Linn. Soc. xxi. 428.
COLIGNONIA BIUMBELLATA *Ball.* Peruvian Andes. Journ. Linn. Soc. xxii. 54.
COTYLEDON CHICHLENSIS and C. INCANUM *Ball.* Peruvian Andes. Journ. Linn. Soc. xxii. 37, 38.
CROTALARIA THOMSONI *Oliv.* E. Africa. Journ. Linn. Soc. xxi. 399.
CRYPTOCORYNE BECKETTII *Thw. MS.* [*Trim.*]. Ceylon. Journ. Bot. 269.
CURCUMA OLIGANTHA *Trim.* Ceylon. Journ. Bot. 245.
CYRTANDRA SERRATA *Fawc.* Timor. Nat. Wand. 513.

CYRTOPODIUM SAINTLEGERIANUM *Rchb. f.* Paraguay. Gard. Chron. xxiii. 756.

DANAIS VESTITA *Baker*. Madagascar. Journ. Linn. Soc. xxi. 408.

DAPHNE LINEARIFOLIA *Hart.* Palestine. Trans. R. Irish Acad. xxviii. 442. t. 16.

DELPHINIUM MACROCENTRON *Oliv.* E. Africa. Journ. Linn. Soc. xxi. 397.

DENDROBIUM ALBIDULUM *Thw. MS.* [*Trim.*]. Ceylon. Journ. Bot. 243. — D. ATRACTODES *Ridl.* Siam. Journ. Bot. 123. — D. ERYTHROPOGON *Rchb. f.*, n. sp. ("hyb. nat.?"), Sunda. Gard. Chron. xxiv. 198. — D. PARDALINUM *Rchb. f.* Id. 230. — D. PARTHENIUM *Rchb. f.* Borneo. Id. 489.

DESCHAMPSIA MATHEWSII *Ball.* Peruvian Andes. Journ. Linn. Soc. xxii. 60.

DIANTHERA TERMINALIS *Fawc.* Timor. Nat. Wand. 513.

DIANTHUS ACUMINATUS (Syria), D. ANDERSONII (Syria), D. COLENSOI (Natal), D. LUSITANIOIDES (Palestine), D. MULTISQUAMATUS (Kurdistan), D. PUBERULUS (Luristan), D. PURPUREUS (Syria), D. SCHLOSSERI (Europe), D. SYRIACUS (Syria), all of *F. N. Williams.* Journ. Bot. 342–349.

DIDYMOCARPUS VESTITA *Baker*. Madagascar. Journ. Linn. Soc. xxi. 427.

DIMERIA LAXIUSCULA *Thw. MS.* [*Trim.*]. Ceylon. Journ. Bot. 272.

DIOSCOREA ACUMINATA *Baker*. Madagascar. Journ. Linn. Soc. xxi. 449. — D. CRINITA *Hook. f.* Natal. Bot. Mag. t. 6804.

DIOSMA FLAVESCENS *Oliv.* Cape. Ic. Pl. 1476.

DIOSPYROS FUSCOVELUTINA, D. GONOCLADA, D. MEGASEPALA, D. SPHÆROSEPALA, all of *Baker*. Madagascar. Journ. Linn. Soc. xxi. 422–24.

DISA AFFINIS *N. E. Br.* S. Africa. Gard. Chron. xxiv. 402. — D. ÆMULA, D. BODKINI, D. LINEATA, D. PYGMÆA, D. RETICULATA, D. SCULLYI, D. TENUICORNIS, all of *Bolus.* S. Africa. Journ. Linn. Soc. xxii. 68–74.

DISPERIS MACOWANI, D. OXYGLOSSA, D. TYSONI, D. WOODII, all of *Bolus.* S. Africa. Journ. Linn. Soc. xxii. 76–79. — D. ZEYLANICA *Trim.* Ceylon. Journ. Bot. 245.

DIURIS FRYANA *Ridl.* Timor. Nat. Wand. 519. — D. TRICOLOR *Fitzg.* N. S. Wales. Journ. Bot. 137.

DOONA OBLONGA *Thw. MS.* [*Trim.*]. Ceylon. Journ. Bot. 206.

DRACÆNA XIPHOPHYLLA *Baker*. Madagascar. Journ. Linn. Soc. xxi. 449.

DRACONTIUM FŒCUNDUM *Hook. f.* Guiana. Bot. Mag. t. 6808.

DRYMERIA NITIDA *Ball.* Peruvian Andes. Journ. Linn. Soc. xxii. 31.

ECHINOLÆNA MADAGASCARIENSIS *Baker*. Madagascar. Journ. Linn. Soc. xxi. 452.

ELÆOCARPUS HENRYI *Hance.* China. Journ. Bot. 322.

EPIDENDRUM FALSILOQUUM *Rchb. f.* Gard. Chron. xxiii. 566. — E. PUNCTULATUM *Rchb. f.* Id. xxiv. 70.

ERAGROSTIS MAXIMA *Baker*. Madagascar. Journ. Linn. Soc. xxi 454.

ERIA ELWESII *Rchb. f.* Gard. Chron. xxiii. 439. — E. LINEOLIGERA *Rchb. f.* Siam. Id. xxiv. 362. — E. RIMANNI *Rchb. f.* Burmah. Id. 712.

ERITRICHIUM MANDONII *Ball.* Peruvian Andes. Journ. Linn. Soc. xxii. 51.

ERIOCAULON FLUVIATILE *Trim.* Ceylon. Journ. Bot. 270.

EUCHARIS MASTERSII *Baker.* N. Granada. Bot. Mag. t. 6381.

EUGENIA GRACILENTA *Hance.* China. Journ. Bot. 7.—E. HAECKELIANA *Trim.* Ceylon. Id. 207.—E. HENRYI *Hance.* China. Id. 7. E. MYRSINIFOLIA *Hance.* China. Id. 8.—E. PHILLYREOIDES *Trim.* Ceylon. Id. 207.—E. TEPHRODES *Hance.* China. Id. 7.

EULOPHIA GALBANA *Ridl.* Madagascar. Journ. Linn. xxi. 469.—E. MEGISTOPHYLLA *Rchb. f.* Madagascar. Gard. Chron. xxiii. 786. —E. PILEATA, E. RAMOSA, E. RETICULATA, E. VAGINATA, all of *Ridley.* Madagascar. Journ. Linn. Soc. xxi. 467–70.

EUPATORIUM MELANADENIUM *Hance.* China. Journ. Bot. 325.

EUPHORBIA TETRAPTERA *Baker.* Madagascar. Journ. Linn. Soc. xxi. 440.

EUSTREPHUS TIMORENSIS *Ridl.* Timor. Nat. Wand. 520.

FESTUCA CASAPALTENSIS *Ball.* Peruvian Andes. Journ. Linn. Soc. xxii. 62.

FICUS APODOCEPHALA *Baker.* Madagascar. Journ. Linn. Soc. xxi. —F. CAUDICULATA *Trim.* Ceylon. Journ. Bot. 242.—F. MEGAPODA, F. PODOPHYLLA, F. SPHÆROPHYLLA, F. TILIÆFOLIA, and F. TRICHOPHYLLA, all of *Baker.* Madagascar. Journ. Linn. Soc. xxi. 443–45.—F. TRIMENI *King.* Ceylon. Journ. Bot. 243.

GAERTNERA PHANEROPHLEBIA and G. PHYLLOSTACHYA *Baker.* Madagascar. Journ. Linn. Soc. xxi. 425.

GALIUM PETRÆ *Hart.* Palestine. Trans. R. Irish Acad. xxviii. 433, t. 16.

GARNOTIA POLYPOGONOIDES *Munro MSS.* [*Oliv.*]. Ic. Pl. 1481.

GEOPHILA GERRARDI *Baker.* Madagascar. Journ. Linn. Soc. xxi. 413.

GETHYLLIS BRITTENIANA *Baker*, and G. LATIFOLIA *Masson MS.* [*Baker*]. S. Africa. Journ. Bot. 227, 228 (tt. 259, 260.)

GLADIOLUS WATSONIOIDES *Baker.* E. Africa. Journ. Linn. Soc. xxi. 405.

GOVENIA SULPHUREA *Rchb. f.* Paraguay. Gard. Chron. xxiv. 70.

GUSSONEA CORNUTA *Ridl.* Comoro Is. Journ. Bot. 310.

HABENARIA ALTA, H. BIMACULATA, H. DISOIDES, H. HILDEBRANDTII, H. HILSENBERGII, H. IMERINENSIS, all of *Ridley.* Madagascar. Journ. Linn. Soc. xxi. 503–509.—H. MELVILLII *Ridl.* Brazil. Journ. Bot. 170.—H. MINUTIFLORA, H. MISERA, H. NUTANS, H. PAPILLOSA, *Ridley.* Madagascar. Journ. Linn. Soc. xxi. 503–509. — H. PLEISTADENIA *Rchb. f.* E. Africa. Journ. Linn. Soc. xxi. 404.— H. STRICTA and H. TENERRIMA *Ridl.* Madagascar. Journ. Linn. Soc. xxi. 510, 505.—H. THOMSONI *Rchb. f.* E. Africa. Journ. Linn. Soc. xxi. 404.—H. TIMORENSIS *Ridl.* Timor. Nat. Wand. 519.

HEDYOTIS BRACTEOSA *Hance.* China. Journ. Bot. 323.—H. RHINOPHYLLA *Thw. MS.* [*Trim.*]. Ceylon. Id. 208. — H. TRICHOGLOSSA *Baker.* Madagascar. Journ. Linn. Soc. xxi. 409. — H. XANTHOCHROA *Hance.* China. Journ. Bot. 324.

HELEOCHARIS CÆSPITOSISSIMA *Baker.* Madagascar. Journ. Linn. Soc. xxi. 450.

HELICHRYSUM LEUCOSPHÆRUM and H. PYLOCLADUM *Baker*. Madagascar. Journ. Linn. Soc. xxi. 417–18.

HIERACIUM CHICLENSE *Ball*. Peruvian Andes. Journ. Linn. Soc. xxii. 47.

HOLARRHENA ? MADAGASCARIENSIS *Baker*. Journ. Linn. Soc. xxi. 424.

*HOLOCARPA (Rubiaceæ, Anthospermeæ). — H. VERONICOIDES *Baker*, sp. unica. Madagascar. Journ. Linn. Soc. xxi. 414.

HYDROSTACHYS STOLONIFERA *Baker*. Madagascar. Journ. Linn. Soc. xxi. 435.

HYMENODICTYON PARVIFOLIUM *Oliv*. E. Trop. Africa. Ic. Pl. 1488.

HYOBANCHE ATROPURPUREA *Bolus*. S. Africa. Ic. Pl. 1486.

HYPOESTES JASMINOIDES, H. STACHYOIDES, H. TRICHOCHLAMYS and H. UNILATERALIS, all of *Baker*. Madagascar. Journ. Linn. Soc. xxi. 431–32.

IMPATIENS KILIMANJARI *Oliv*. and I. THOMSONI *Oliv*. E. Africa. Journ. Linn. Soc. xxi. 398.

ISOGLOSSA GRACILLIMA and I. MELLERI *Baker*. Madagascar. Journ. Linn. Soc. xxi. 420–31.

IRIS VARTANI *Foster*. Palestine. Gard. Chron. xxiii. 438.

IXORA EMIRNENSIS *Baker*. Madagascar. Journ. Linn. Soc. xxi. 412. —I. GRACILIS *R. Br. MSS.* (*Fawc.*), and I. QUINQUIFIDA *R. Br. MSS.* (*Fawc.*). Timor. Nat. Wand. 508.

JUSTICIA TRICHOPHYLLA and J. TRITICEA *Baker*. Madagascar. Journ. Linn. Soc. xxi. 428.

KNIPHOFIA BUCHANANI, K. ENSIFOLIA, K. INFUNDIBULARIS, K. NATALENSIS, K. PAUCIFLORA, all of *Baker*. Cape. Journ. Bot. 276–280; K. THOMSONI *Baker*. Journ. Linn. Soc. xxi. 406.

LAGENANDRA INSIGNIS *Trim*. Ceylon. Journ. Bot. 269.

LASIANTHUS FORDII *Hance*. China. Journ. Bot. 324.

LEPTACTINA TETRALOBA *N. E. Br*. E. Trop. Africa. Gard. Chron. xxiv. 391.

LEUCAS MASAIENSIS *Oliv*. E. Africa. Journ. Linn. Soc. xxi. 403.

LEUCOPOGON OBOVATUS *Fawc*. Timor. Nat. Wand. 509.

LIPARIS AURITA *Ridl*. Timor. Nat. Wand. 518. — L. BICORNIS, L. CONNATA, L. LONGICAULIS, L. LONGIPETALA, L. LUTEA, L. OCHRACEA, L. ORNITHORRHYNCHOS, L. PARVA, all of *Ridley*. Madagascar. Journ. Linn. Soc. xxi. 458–62.

LORANTHUS FORDII *Hance*. China. Journ. Bot. 38.

LUGONIA ANDINA *Ball*. Peruvian Andes. Journ. Linn. Soc. xxii. 49.

MACARANGA MYRIOLEPIDA and M. RIBESIOIDES *Baker*. Madagascar. Journ. Linn. Soc. xxi. 442.

MACHILUS SALICINA *Hance*. China. Journ. Bot. 327.

MÆSA PULCHELLA *Fawc*. Timor. Nat. Wand. 509.

MASDEVALLIA SENILIS *Rchb. f*. Gard. Chron. xxiv. 489.

MAXILLARIA PRÆSTANS *Rchb. f*. Guatemala. Gard. Chron. xxiii. 556.

MELANTHERA MADAGASCARIENSIS *Baker*. Madagascar. Journ. Linn. Soc. xxi. 418.

MELODINUS FORBESII *Fawc*. Timor. Nat. Wand. 510.

MILLETTIA CAMERANA ("species or variety") *Muell*. Norfolk Island. Journ. Bot. 358.

MONOCHILUS GYMNOCHILOIDES *Ridl*. Madagascar. Journ. Linn. Soc. xxi. 499.

Mormodes Dayanum *Rchb. f.* Gard. Chron. xxiv. 552.
Mussænda fuscopilosa and M. macropoda *Baker*. Madagascar. Journ. Linn. Soc. xxi. 410.
Mystacidium graminifolium, M. ochraceum, M. tenellum, all of *Ridley*. Madagascar. Journ. Linn. Soc. xxi. 488–90.
Oberonia glandulifera *Ridl.* Timor. Nat. Wand. 518.
Odontoglossum viminale *Rchb. f.* Columbia. Gard. Chron. xxxi. 108.
Œnothera psychrophila *Ball.* Peruvian Andes. Journ. Linn. Soc. xxi. 38.
Oldenlandia latifolia *Baker*. Madagascar. Journ. Linn. Soc. xxi. 409.
Oncidium caloglossum *Rchb. f.* Trop. America. Gard. Chron. xxiv. 166.—O. crocodiliceps *Rchb. f.* Mexico. Id. 360.—O. Hubschii *Rchb. f.* Ecuador. Id. 650.—O. ludens *Rchb. f.* Id. xxiii. 756.
Oncoba lasiocalyx *Oliv.* E. Trop. Africa. Ic. Pl. 1485.
Oncostemum neriifolium, O. pyatycladum and O. venulosum, all of *Baker*. Madagascar. Journ. Linn. Soc. xxi. 421–22.
Oplismemus bromoides *Baker*. Madagascar. Journ. Linn. Soc. xxi. 452.
Orthosiphon brevicaulis, O. emirnensis and O. secundiflorus, all of *Baker*. Madagascar. Journ Linn. Soc. xxi. 433.
Pandanus ceratophorus, P. concretus, P. microcephalus, P. oligocephalus, all of *Baker*. Madagascar. Journ. Linn. Soc. xxi. 447–48.
Panicum blephariphyllum *Trim.* Ceylon. Journ. Bot. 272.—P. reticulatum *Trim.* Ceylon. Id. 271.
Passiflora lancearia *Mast.* Costa Rica.—P. Lehmanni *Mast.* N. Granada. Journ. Bot. 114, 115.
Peliosanthes macrostegia *Hance*. China. Journ. Bot. 328.
Pennisetum triticoides *Baker*. Madagascar. Journ. Linn. Soc. xxi. 453.
Pentas micrantha *Baker*. Madagascar. Journ. Linn. Soc. xxi. 408.
Pescatorea Ruckeriana *Rchb. f.* Gard. Chron. xxiv. 424.
Philodendron Glaziovii *Hook. f.* Brazil. Bot. Mag. t. 6813.
Phœnix zeylanica *Trim.* Ceylon. Journ. Bot. 267.
Phyllanthus Hakgalensis *Thw. MS.* [*Trim.*] (errore *Uakgalensis*). Ceylon. Journ. Bot. 242.
Pilea capitata and P. longipes *Baker*. Madagascar. Journ. Linn. Soc. xxi. 446.—P. Wattersii *Hance*. China. Journ. Bot. 327.
Pimelea brevituba *Fawc.* Timor. Nat. Wand. 516.
Piper pachyphyllum *Baker*. Madagascar. Journ. Linn. Soc. xxi. 436.
Plectranthus cymosus *Baker*. Madagascar. Journ. Linn. Soc. xxi. 434.—P. veronicifolius *Hance*. China. Journ. Bot. 327.
Plectronia Boiviniana and P. buxifolia *Baker*. Madagascar. Journ. Linn. Soc. xxi. 411.
Pleurothallis liparanges *Rchb. f.* Brazil. Gard. Chron. xxiii. 532.
Podocarpus madagascariensis *Baker*. Madagascar. Journ. Linn. Soc. xxi. 447. — [P. insignis *Hemsl.* Journ. Bot. 287. = P. argotænia *Hance*.]

POGONIA BARKLYANA *Rchb. f.* S. Africa. Gard. Chron. xxiii. 726.—P. FORDII *Hance*. China. Journ. Bot. 247.—P. PULCHELLA *Hook. f.* Hong Kong. Bot. Mag. 6851.

POLYGONUM ACAULE *Hook. f.* and P. PERPUSILLUM *Hook. f.* Himalayas. Ic. Pl. 1490.

POLYSTACHYA ANCEPS, P. ROSEA, P. VIRESCENS, all of *Ridley*. Madagascar. Journ. Linn. Soc. xxi. 473–74.

PRASOPHYLLUM ANSATUM, P. ATTENUATUM, P. DENSUM, P. ERIOCHILUM, P. FILIFORME, P. LAMINATUM, P. LONGISEPALUM, P. REFLEXUM, P. VIRIDE, all of *Fitzgerald*, from N. S. Wales. Journ. Bot. 135-7.

*PSEUDOEUGENIA (Myrtaceæ).—P. PERAKIANA *Scortechini*. Malaya. Journ. Bot. 153.

PSORALEA FOLIOSA *Oliv.* E. Africa. Journ. Linn. Soc. xxi. 399.

PSYCHOTRIA LUCIDULA and P. MESENTERICARPA *Baker*. Madagascar. Journ. Linn. Soc. xxi. 412–13.

*PSYLLOTHAMNUS (Illecebraceæ). — P. BEEVORI *Oliv.* sp. unica. Aden. Ic. Pl. 1499.

PTEROSTYLIS CLAVIGERA *Fitzg.* N. S. Wales. Journ. Bot. 138.

RANUNCULUS CHICHENSIS *Ball.* Peruvian Andes. Journ. Linn. Soc. xxii. 28.

RUELLIA BREVICAULIS *Baker*. Madagascar. Journ. Linn. Soc. xxi. 428.

SACCOLABIUM CŒLESTE *Rchb. f.* Gard. Chron. xxiii. 692.

SALVIA SCAPIFORMIS *Hance*. Formosa. Journ. Bot. 368.

SATYRIUM CALCEATUM *Ridl.* Madagascar. Journ. Linn. Soc. xxi. 520. — S. DEBILE, S. EMARCIDUM, S. OCHROLEUCUM, all of *Bolus*. S. Africa. Journ. Linn. Soc. xxii. 66, 67.

SCHISMATOCLADA CONCINNA and S. VIBURNOIDES *Baker*. Madagascar. Journ. Linn. Soc. xxi. 407.

SCHISMATOGLOTTIS NEO-GUINEENSIS *N. E. Br.* N. Guinea. Gard. Chron. xxiv. 776.

SCUTELLARIA SPICATA *Trim.* Ceylon. Journ. Bot. 241.

SEDUM ANDINUM *Ball.* Peruvian Andes. Journ. Linn. Soc. xxii. 38.—S. FORMOSANUM *N. E. Br.* Formosa. Gard. Chron. xxiv. 134.

SELAGO THOMSONI *Rolfe*. E. Africa. Journ. Linn. Soc. xxi. 402.

SELENIPEDIUM KAIETEURUM *N. E. Br.* Gard. Chron. xxiv. 262.

SENECIO CASAPALTENSIS *Ball.* Peruvian Andes. Journ. Linn. Soc. xxii. 47. — S. PURPUREO-VIRIDIS *Baker*. Madagascar. Id. xxi. 419.—S. SEGMENTATUS *Oliv.* Ic. Pl. 1483.

SHOREA BREVIPETIOLARIS *Thw. MS.* [*Trim.*], and S. DYERII *Thw. MS.* [*Trim.*]. Ceylon. Journ. Bot. 204, 205.

SOLANUM MYOXOTRICHUM *Baker*. Madagascar. Journ. Linn. Soc. xxi. 426.

SONERILA GUNERATNEI *Trim.* Ceylon. Journ. Bot. 208.

SOPUBIA STRICTA *Baker*. Madagascar. Journ. Linn. Soc. xxi. 427.

SPARGANIUM NEGLECTUM *Beeby*. England. Journ. Bot. 26, 193 (t. 258).

SPHÆRANTHUS GRACILIS *Oliv.* E. Africa. Journ. Linn. Soc. xxi. 400.

STRUTHIOLA THOMSONI *Oliv.* E. Africa. Journ. Linn. Soc. xxi. 404.

TARENNA MACROCHLAMYS *Baker*. Madagascar. Journ. Linn. Soc. xxi. 411.
TEINOSTACHYUM ? MACULATUM *Trim*. Ceylon. Journ. Bot. 273.
TENARIS ROSTRATA *N. E. Br.* Zanzibar. Gard. Chron. xxiv. 39.
THELYMITRA FORBESII *Ridl.* Timor. Nat. Wand. 518.
THUNBERGIA CONVOLVULIFOLIA *Baker*. Madagascar. Journ. Linn. Soc. xxi. 428.
TRICHOCLADUS GRANDIFLORUS *Oliv*. Transvaal. Ic. Pl. 1480.
TRIFOLIUM CHICLENSE *Ball*. Peruvian Andes. Journ. Linn. Soc. xxii. 35.
TRIUMFETTA CONSPICUA *Trim*. Ceylon. Journ. Bot. 206.
TRYPHOSTEMMA HANNINGTONIANUM *Mast.** [*Oliv.*]. Trop. Africa. Ic. Pl. 1484.
TURRÆA WAKEFIELDII *Oliv*. E. Trop. Africa. Ic. Pl. 1489.
TYLOPHORA FLAVA *Trim*. Ceylon. Journ. Bot. 239.
UAPACA CLUSIOIDES and U. MYRICÆFOLIA *Baker*. Madagascar.
UEBELINIA ROTUNDIFOLIA *Oliv*. E. Africa. Journ. Linn. Soc. xxi. 397. Journ. Linn. Soc. xxi. 440–41.
URERA SPHÆROPHYLLA *Baker*. Madagascar. Journ. Linn. Soc. xxi. 445.
UTRICULARIA IBARENSIS *Baker*. Madagascar. Journ. Linn. Soc. xxi. 427.
VACCINIUM FORBESII *Fawc.*† Sumatra. Nat. Wand. 278 (fig.). — V. TIMORENSE *Fawc*. Timor. Nat. Wand. 509.
VALERIANA REMOTA *Ball*. Peruvian Andes. Journ. Linn. Soc. xxii. 42.
VANILLA HUMBLOTII *Rchb. f.* Madagascar. Gard. Chron. xxiii. 726.
VATERIA NERVOSA *Thw. MS.* [*Trim.*]. Ceylon. Journ. Bot. 206.
VATICA OBSCURA *Trim*. Ceylon. Journ. Bot. 203.
VERNONIA POLYTRICHOLEPIS, V. STREPTOCLADA, V. TRICHANTHA, V. VOLUTA, all of *Baker*. Madagascar. Journ. Linn. Soc. xxi. 415–16.
VIBURNUM FORBESII *Fawc*. Timor. Nat. Wand. 506.
VISCUM APODUM, V. CUNEIFOLIUM, V. GRANULOSUM, V. LOPHIOCLADUM, V. RADULA, V. RHYTIDOCARPUM, V. TRACHYCARPUM, all of *Baker*. Madagascar. Journ. Linn. Soc. 437–39.
VITEX TRICHANTHA *Baker*. Madagascar. Journ. Linn. Soc. xxi. 434.
WRIGHTIA FLAVIDOROSEA *Trim*. Ceylon. Journ. Bot. 238.
ZYGOPETALUM KLABOCHII *Rchb. f.* N. Granada. Gard. Chron. xxiv. 391.—Z. LAMINATUM *Rchb*. Id. 70.

---

* [On referring to the 'Enumeration of Plants collected by Mr. H. H. Johnston' (the Kilima-njaro Expedition, pp. 337—349) we find the name stands "*Tryphostemma Hanningtonianum* Mast.," without any description or indication that the species is a new one, or any reference to 'Ic. Plant.,' where is the only description yet published.—ED. JOURN. BOT.].

† [Mr. Fawcett (in Journ. Bot. 254) subsequently proposed the name *Dempoense* for this plant, that of *Forbesii* being preoccupied (Hook. Ic. Pl. 345). Mr. Baker, however (Journ. Linn. Soc. xx. 194), has identified *V. Forbesii* Hook. with *V. emirnense* Hook., so that Mr. Fawcett's original name may stand.—ED. JOURN. BOT.].

NOTICES OF BOOKS.

Hepaticæ Amazonicæ et Andinæ, quas in itinere suo per tractus montium et fluviorum Americæ Æquinoctialis a fluminis Amazonum ostiis ad Maris Pacifici litora usque, necnon a cataractis fluminis Orinoci, cis æquatorem, adusque fluvii Huallaga cataractas, Lat. 6°–7° australi, annis 1849–1862, decerpsit nuperiusque descripsit Richard Spruce. Trans. Bot. Soc. Edinb. Vol. xv. Parts i. & ii. 1884–5.—Hepaticæ of the Amazon, and of the Andes of Peru and Ecuador. 8vo, pp. 588, tt. 22, cloth. Trübner.

We congratulate Dr. Spruce very heartily on the completion of his great work on the Amazonian Hepaticæ. Few who saw him on his return from that fascinating but malarious region could have believed that he would live to arrange and describe the unrivalled collection made by him. The first specimen was picked on July 13th, 1849, and the last about the close of 1862. His return to England was delayed until May 1st, 1864. For the last two years he remained on the desert coast of Peru prostrate with dysentery, and in this region not a single Hepatic was seen. We may remind our younger readers that before leaving England Richard Spruce had made his mark as one of the most promising bryologists of his day. His first paper, "On the Mosses and Hepaticæ of Teesdale," was published in the 'Trans. Bot. Soc. Edinb.' for 1844; and his memoir, "On the Mosses and Hepaticæ of the Pyrenees," which we had the pleasure of listening to, appeared in the vol. for 1850. We can imagine with what pleasure the friends of that time—Greville, Sir W. Hooker, Dr. Taylor, and W. Wilson—now no more—would have welcomed the work before us!

The author defines 577 species of Equatorial American Hepaticæ, the majority new to science, and all but some half-dozen species collected by himself. Of these species, 283 are *Jubuleæ*, 274 *Jungermannieæ*, and 22 *Marchantiaceæ*. They are arranged under fifty-one genera, whereof eight are new, viz., *Myriocolea*, *Chætocolea*, *Arachniopsis*, *Mytilopsis*, *Anomoclada*, *Clasmatocolea*, *Syzygiella*, and *Symphyomitra*. *Protocephalozia* and *Pteropsiella*, described by the author as subgenera of *Cephalozia*, may, we think, claim the rank of genera. Of the vast genus *Lejeunia* he defines 234 species, and, putting aside the old arrangement of 'Synops. Hepat.' (*Bryopsis*, *Phragmicoma*, *Omphalanthus*, &c.), he distributes them among thirty-five sections, all of which he asserts pass into one another by such insensible gradations, that none of them can be properly separated from *Lejeunia*. The only exception made is in favour of *Myriocolea*, a truly wonderful species, reminding us from the figure (Pl. xxii.) of one of the Hydroid Polypes, rather than of a Liverwort. These binomial sections (*Ceratolejeunia*, *Harpalejeunia*, &c.) have an unaccustomed sound to our ears, but the illustrations, which are carefully lithographed by Carter, from drawings by Dr. Braithwaite, and G. Massee, Esq. (the latter excellent), will assist the student to comprehend the meaning of the author.

Since no distribution of duplicates has yet been made of the new species, it would be premature to discuss them: We propose, therefore, to devote our remaining space to extracts from the text. Before doing so, we would refer our readers to the views of the author as to the terms recently employed in descriptive works. Under *Anomoclada* ('Journ. Bot.' 1876, p. 132) Dr. Spruce remarks, and we think justly, "The terms *dorsal* and *ventral*, as applied to Hepaticæ, is a case in point, the former having been used (first, I believe, by Nees ab Es.) for the upper surface, the latter for the under surface of the stem or of the frond, in accordance with some fancied resemblance to a crawling insect. The postical leaves, which were called *stipules* by Hooker and the older authors, have been called, in conformity with this new way of looking at the plant, *amphigastria* —a notable example of a modern practice of giving a complicate Greek name to a thing, and then fancying we have proved it quite distinct. . . . . Long years ago I pointed out to the late Dr. Taylor, of Dunkerron, how inconvenient it was to find authors speaking of *dorsal* ferns—meaning thereby ferns which bore their fruit on the back, or *under-surface*, of the frond,—and of the *back* of the stem of a *Jungermannia*, or of the *dorsal* lobe of the leaf, when they meant the *upper* surface, or *upper* lobe. He replied, 'You rightly complain of this ambiguity, and the man who first called the stipules *belly-bands* (amphigastria) has much to answer for.'"

The author appears to be as fond of notes as the lamented De Quincy, and those on the distribution and affinities of species, appended to the definitions of subtribes and genera, are always interesting. Thus under *Epigonianthea* (p. 420) we read—"In the subtribe *Trigonanthea* the leading character was to have the perianth flattened from the front, and its primary angles at the axis, or fold, of the three complicate flower-leaves; hence its trigonous form, with a flat front, an angle on each side, and a third angle at back. But in the subtribe *Epigonianthea* the primary angles are at the marginal sutures of the flower-leaves, and not at their axis; so that where there are only two such leaves, and they are pressed together by their faces, a complanate perianth results, at right angles to the normal plane of the leaves, with one of its edges antical, the other postical, as in the large genus *Plagiochila*. Where an underleaf exists, and the flower-leaves are three, the perianth may be trigonous, with the third angle in front, as we see it in *Lophocolea*; or it may still be complanate and ancipitous, if the underleaf be folded along the middle," as in *Leioscyphus*.

Our concluding extract shall be morphological. Under *Plagiochila* (pp. 452–3) we find the following notes:—"Propagula, in the shape of leaf-suckers,—minute branchlets springing from the surface of leaves, and each based on a single cellule,—are frequent enough, and indicate a degree of moisture sufficient to check fertilisation and maintain the plants in perpetual sterility. The leaf-suckers empty the cell from which they arise, and often several adjacent cells, of chlorophyll. When the parent leaf is entirely decayed, the suckers that survive start off on a separate existence, and speedily

assume the normal foliage of the species. . . . . Forty years ago, in the 'Phytologist' for Feb., 1845, ii. 85, I described and figured the way *Herberta adunca* Dicks. . . . . puts forth minute adventitious ramuli from the surface of the leaves; and I have since then noted them in nearly every genus of Hepaticæ, even in *Lejeunia* and *Frullania*."

In conclusion, we would call attention to the fact that a limited number of copies have been assigned to the author. These have been bound in cloth, and may be obtained from Messrs. Trübner.

B. Carrington.

The results of the Edinburgh Forestry Exhibition of 1884 have been published in a handsome volume of nearly 600 pages, entitled 'Forestry and Forest Products' (Edinburgh, Douglas), and edited by Messrs. John Rattray and H. R. Mill. As is to be expected, the essays bear rather on the economical than on the botanical aspect of the subject; some seem of especial valne, such as the one on "Lacquer," by Hikorokuro Yoshida, Chemist to the Imperial Geological Survey of Japan. There is an interesting essay on our timber supplies by Mr. Robert Carrick; and Mr. Boulger's essay, entitled "Bye-Products," dealing with the "utilisation of coppice and of branches, and other fragments of forest-produce, with the view of diminishing waste," is suggestive and practical.

Dr. E. Bonavia has published an interesting little book on 'The Future of the Date Palm in India' (Calcutta, Thacker & Co.: 8vo, pp. 118), which is well worthy the attention of those who are anxious to develop the resources of our Indian Empire. Having long been convinced that "of all the trees which have been tried in India, either for fuel or as a help in times of famine, the date offered the most advantage," and having superintended its cultivation in the Lucknow Horticultural Gardens, the author considers it advisable to bring together the results of his own observations, supplemented by others from different and trustworthy sources. The little work is full of interesting and often out-of-the-way matter, and deserves the attention of practical men.

New Books.—Sir John Lubbock, 'Flowers, Fruits, and Leaves' (Macmillan, 4*s*. 6*d*.: 8vo, pp. xv. 147 : 95 cuts). — W. Barbey, 'Epilobium genus a cl. Ch. Cuisin illustratum auspice William Barbey' (Lausanne, Bridel: 4to, tt. 24). — G. Bouvet, 'Catalogue Raisonné des plantes utiles et nuisibles de la Flore de Maine-et-Loire' (Angers, Germain: 8vo, pp. xvi. 240). — W. D. Miller, 'Wörterbuch der Bacterien Kunde' (Stuttgart, Enke; 8vo, pp. 43). — G. Roster, 'Il Pulviscolo atmosferico ed i suoi microrganismi' (Florence, Loescher: 8vo, pp. xxx. 374, tt. xvi.).— E. D. del Castillo, 'Illustrationes Floræ Insularum Maris Pacifici' (Paris, Masson: 4to, fasc. i. pp. 32, tt. x.).—R. Kidston, 'Catalogue of the Palæozoic Plants in the British Museum' (London: 8vo, pp. viii. 288).

Articles in Journals.

American Naturalist. — E. L. Sturtevant, 'A study of Garden Lettuce.'

Bot. Centralblatt (Nos. 9–11). — M. Dalitzsch, 'Beiträge zur Kenntniss der Blattanatomie der Aroideen.' — (No. 10). S. Korzchinsky, 'Notiz über *Aulacospermum tenuilobum*.'

Bot. Gazette (Feb.). — F. L. Scribner, 'Some Arctic Grasses' (1 plate). — A. P. Morgan, 'Life and labours of Linnæus.' — L. F, Ward, 'Notes on the Flora of Eastern Virginia.' — A. Gray. '*Anemonella thalictroides*.' — (March). D. H. Campbell, 'Development of root in *Botrychium ternatum*' (1 plate). — C. C. Parry, 'On *Eriogoneæ*.' — J. N. Rose, 'Mildews of Indiana.'

Bot. Zeitung (Feb. 19, 26). — A. Meyer, 'Bildung der Stärkekörner in den Laubblättern aus Zuckerarten, Mannit & Glycerin.' — (Feb. 26). E. Laurent, 'Stärkebildung aus Glycerin.' — A. Buchinger, '*Coronilla scorpioides*.' — (March 5, 12, 19). J. Reinke, 'Photometrische Untersuchungen über die Absorption des Lichtes in den Assimilationsorganen.'

Bull. Torrey Bot. Club (Feb.). — L. H. Pammel, 'Structure of testa of several Leguminous seeds' (2 plates). — G. Vasey, 'New American Grasses' (*Panicum Nealleyi*, *Imperata brevifolia*, *Aristida arizonica*, *A. Havardii*, *A. Orcuttiana*, spp. nn.). — (March). J. S. Newberry, 'Flora of the Amboy Clays.' — N. L. Britton, '*Quercus Muhlenbergii*.'

Flora (Feb. 11, 21). — A. Geheeb, 'Vier Tage auf Smölen und Aedö.'— —. Röll, 'Zur Systematik der Torfmoose.' — (Feb. 21). H. Gressner, 'Notiz zur Kenntniss des Involucrums der Compositen.' —(March 1). W. Nylander, 'Addenda nova ad Lichenographiam europæam' (*Lecidea obturbans* and *L. acutula*, spp. nn., from Kendal, Westmoreland).— Id., 'Graphidei Cubani novi.' — (March 11). L. Staby, 'Neber den Verschluss der Blattnarben nach Abfall der Blätter' (1 plate). — J. Müller, 'Lichenologische Beiträge.'

Gardeners' Chronicle (Feb. 27). — W. B. Hemsley, 'Concerning Figs.'—(March 6). R. A. Rolfe, 'Flowers and Insects.'—*Kalanchoe carnea* N. E. Br., sp. n. — Obituary of E. Morren (Dec. 2, 1833–Feb. 28, 1886). — W. G. Smith, 'Corn Mildew and Barberry Blight' (figs. 58–60). — (March 20). N. E. Brown, '*Mesembryanthemum ficiforme*' (fig. 73).— Proliferation in *Trichomanes* (fig. 72).—W. B. Grove, 'A fungous disease of *Eucharis*' (figs. 74–78). — G. Syme, '*Abies nobilis*.'

Midland Naturalist.—J. E. Bagnall, 'Notes on the Anker Valley and its Flora.'

Oesterr. Bot. Zeitschrift. — R. v. Wettstein, 'Neue Pilze aus Nieder-Oesterreich' (*Ustilago Primulæ*, *Cantharellus gregarius*, spp. nn.).—E. Woloszczuk, '*Salix scrobigera* (*S. cinerea* × *grandifolia*).' — E. Formánek, 'Mälvische Rosen.' — V. v. Borbás, 'Zur Verbreitung & Teratologie von *Typha* & *Sparganium*.'

Trans. Bot. Soc. Edinburgh (vol. xvi. pt. 2).— J. Rattray, 'New cases of Epiphytism among Algæ.' — Id., 'Evolution of Oxygen by

Sea-weeds.'—D. Landsborough, 'Australian and N. Zealand plants grown in Arran.' — W. Craig, 'Excursion of Scottish Alpine Bot. Club to Teesdale in 1884.' — J. Buchanan, 'Vegetation and vegetable products of Blantyre and Zourba districts of Africa.' — J. Lowe, '*Asplenium germanicum*.' — A. Dickson, 'Development of bifoliar spurs into ordinary buds in *Pinus sylvestris*.'

LINNEAN SOCIETY OF LONDON.

February 18, 1886.—Prof. St. George Mivart, F.R.S., in the chair. —Prof. H. Macaulay Posnett, of New Zealand, was elected a Fellow of the Society.—There was shown for Mr. W. Joshua over 130 specimens of lichens, collected and preserved by Mr. G. Hart, of Gordon Town, Jamaica, and determined by Dr. J. Müller (Arg.), of Geneva; many of these were rare and of interest. Microscopic slides, for low powers, of a large number of the foregoing, were also shown.—Mr. T. Christy called attention to a new Cinchona bark from South Africa; and to a plant of *Erythoxylon Coca* in fruit. — Mr. J. Ball read a paper "On the Botany of Western South America." In his introduction he deals with the climatal relations of the western seaboard of that continent, which have such a remarkable influence on the development of vegetable life. Panama and the Isthmus of Darien have a temperature of about 80° F., with seven months rainy season. To near the Gulf of Chocho the rainy season increases, and the maximum of rainfall appears to lie some 40° N. of the Equator. The coast of Tumaco, on the frontier of Eucador, indicates a distinct change of climate, and the low country of Eucador, between the Andes and the sea, has what may be called a normal equatorial climate, with six months rainy season. Capes San Lorenzo and Santa Elena, however, are arid, being influenced by southerly currents of dry air. The coasts of the Gulf of Guayaquil and Tumbez, the frontier part of Peru, have an equatorial climate, but at Cape Blanco, 4° S. lat., the cold Humboldt current from the Southern Ocean reduces the temperature more than 10°, and this extends to Copiapò, or a stretch of 1700 miles. Southwards the desert region becomes modified, and the aridity is succeeded by a climate resembling the south of Europe. Such is central Chili, marked by a peculiar flora with a large number of endemic genera and species, allied to forms inhabiting the middle and higher zones of the Andes; this even at Coquimbo, 30° S. lat. It has been observed that where fogs rest in winter, even in the so-called rainless zone of Peru and Chili, considerable vegetation exists, this however, ceasing abruptly outside the limit of the cloud. Southern Chili is influenced by warm westerly winds, and at Concepcion and Lota the characteristic type-plants of Central Chili disappear. At the Chonos Archipelago the representatives of subtropical types cease about 44° S.; thence southwards the antarctic flora extends uniformly to Cape Horn. Indeed, the dominant beech forests, abundance of delicate ferns, *Drimys*, *Desfontainea*, &c., entitle the

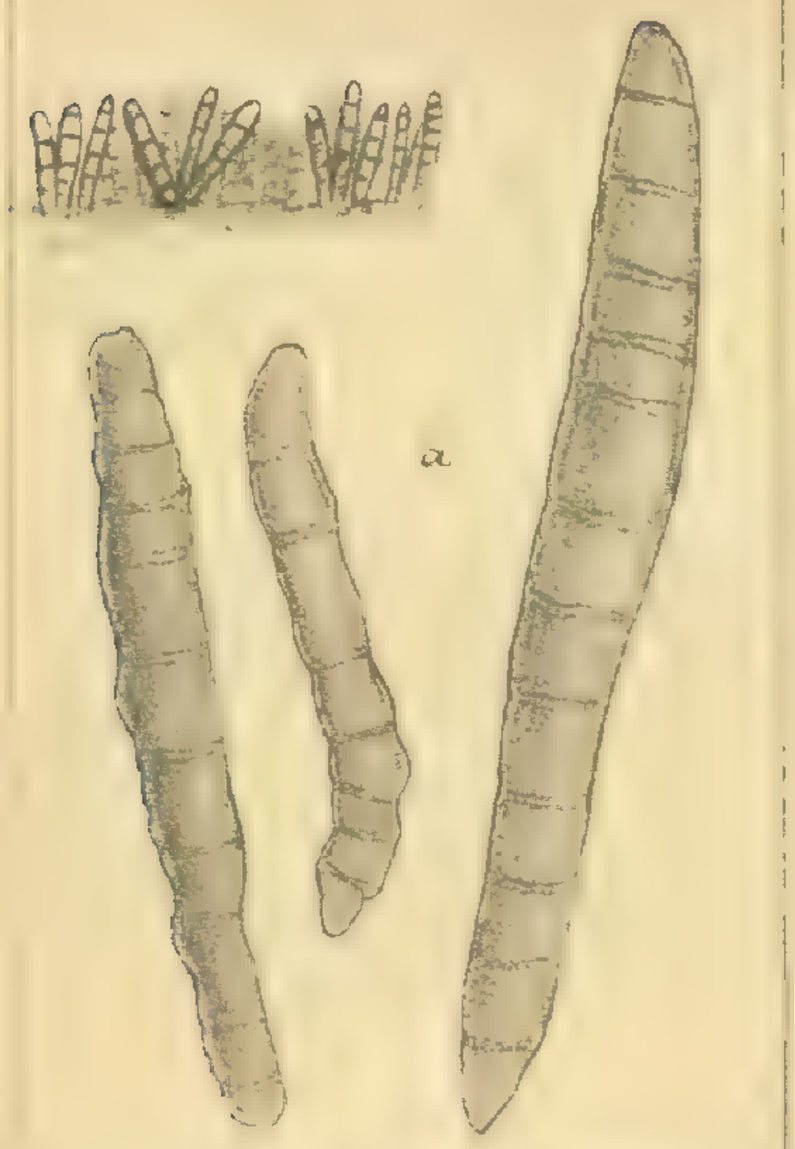
name "Magellanic" as appropriate to the latter province. Mr. Ball then describes his collection of plants from Buena-Ventura, in Columbia. He infers that the vast region including the warm and moist parts of South and Central America should be regarded as a single botanical province, in which the same generic types are represented by species of which a large proportion are endemic and confined to comparatively small areas. Along with these we find, in various parts of the same region, a few forms so distinct as to be ranked as separate genera, mostly represented by one or very few species, and nearly allied to types of wide distribution. In a broad sense it may be said that the most natural divisions of the vegetation of the earth are wide areas of low country, over which, with more or less modification, a limited number of types have extended, with islands of high land which are the homes of the special types that form the characteristic features of the floras of different regions. Mr. Ball afterwards deals with the flora of Payta in North Peru, with the flora of Caldera in Northern Chili, and of Lota in Chili; and lastly, briefly refers to his collections in the channels of Western Patagonia and Straits of Magellan.

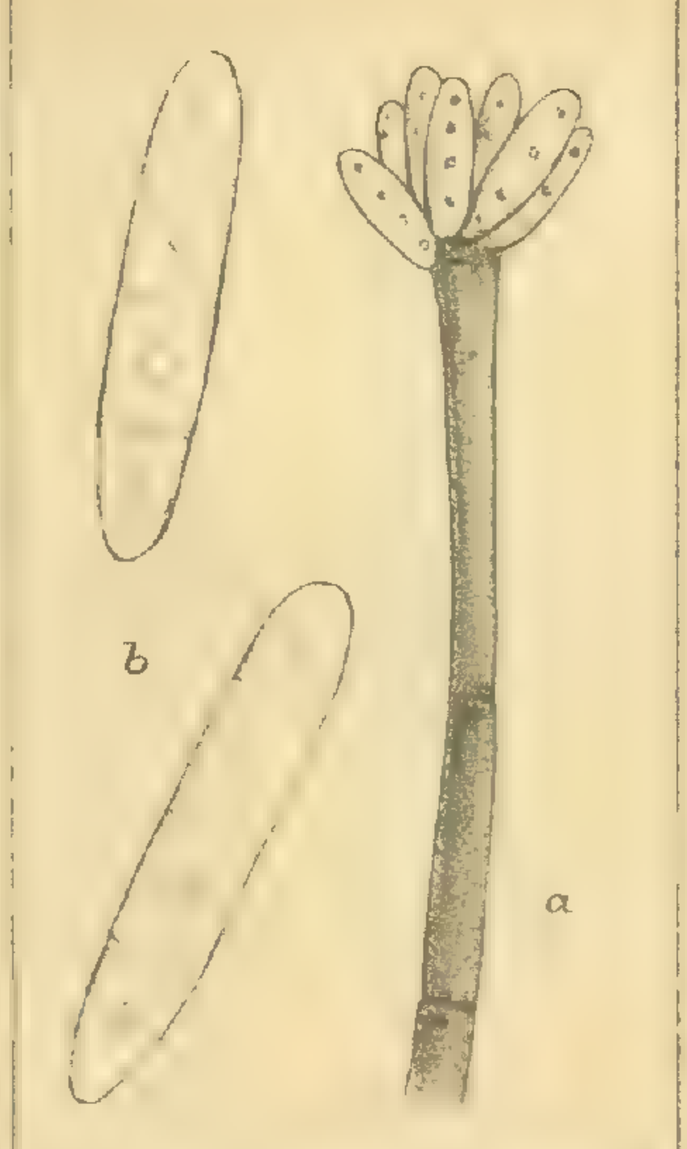
March 4. — Sir John Lubbock, Bart. F.R.S., President, in the chair. — Messrs. Gilbert C. Bourne, W. H. Cattell, and Thomas A. Cotton, were elected Fellows of the Society.—There was exhibited for Miss Onslow a volume of water-colour drawings of British plants, which had been sketched from nature by the late Miss Moseley, of Great Malvern; the volume was one of nine drawn by her.—A paper was read by Mr. George Murray, "On a New Species of *Rhipilia* (*R. Andersoni*) from the Mergui Archipelago." The specimen in question was collected by Dr. John Anderson, F.L.S. (superintendent of the Calcutta Museum), in 1882, and recently presented to the British Museum. It was found growing on mud-flats in King's Island Bay. The genus *Rhipilia* was established by Kützing for the reception of two species, *R. tomentosa* and *R. longicaulis*, collected by Jorden in the Antilles. To these Prof. Dickie added *R. Rawsoni*, from Barbadoes. The new species, *R. Andersoni*, differs from *R. tomentosa* and *R. longicaulis* in the frond being completely sessile on the mass of rhizoids, and from *R. Rawsoni* in the sessile frond being entire. A hitherto unidentified, injured, imperfect specimen, brought by Cuming from the East, is now found to be identical with Dr. Anderson's example, which is well preserved in spirit, and thus the oriental habitat of the genus is corroborated. The author describes and illustrates the peculiarities of the rhizoid filaments.—A second paper was read by Mr. G. Murray, "On two new species of *Lentinus*, one of them growing on a large *Sclerotium*." The one specially referred to in the title (*L. scleroticola*) comes from Samoa, where it was collected by the Rev. S. J. Whitmee. Its mycelium inhabits the tissue of the large *Sclerotium*, and is supposed by the author to be perennial within it, giving rise to successive crops of *Lentinus* under suitable circumstances. The author compares it with the *Lentium Tuber regium* Fr., of Amboina, the original account of which is to be found in Rumphius's 'Herbarium Amboinense.'—

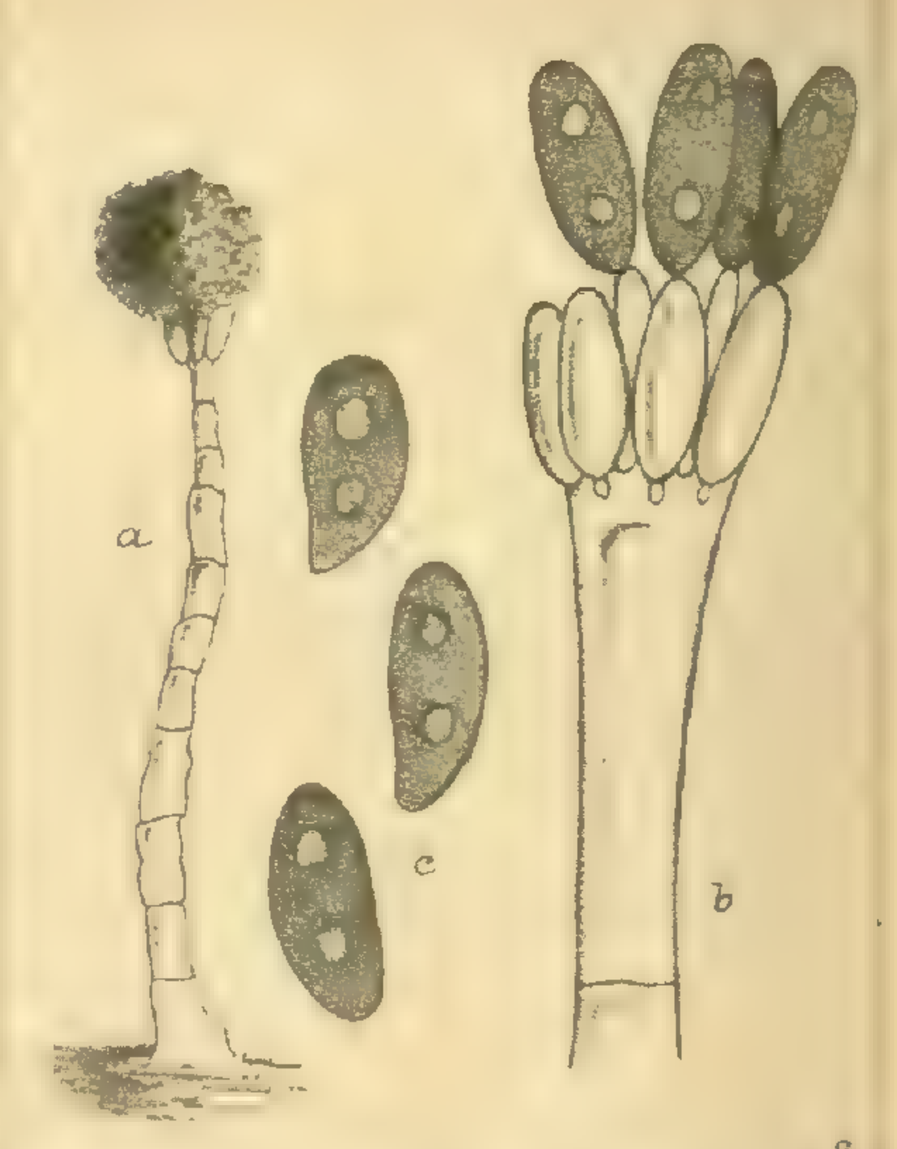
Mr. J. G. Baker then orally gave the gist of a communication "On a Collection of Ferns made in North Borneo by the Bishop of Singapore and Sarawak."

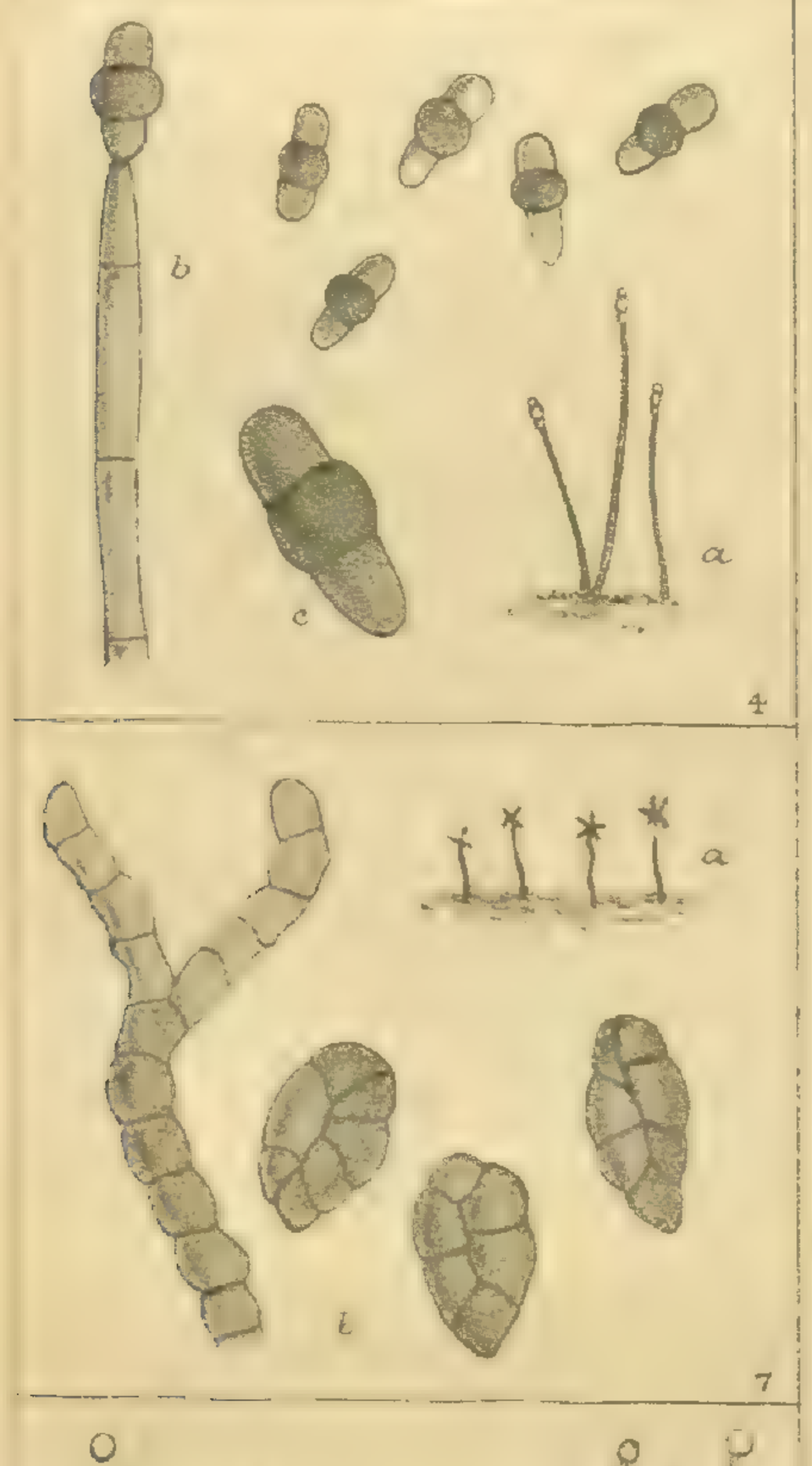
OBITUARY.

We fear that the accuracy of the report of the murder of the Rev. James Hannington, D.D., F.L.S., Bishop of East Equatorial Africa, can no longer be doubted. By his death we have lost an enthusiastic botanist, who was well acquainted with the flora of his native country, and who, as far as his limited opportunities permitted, contributed to our knowledge of the flora of Tropical Africa. In 1882 he led a mission party across the Continent, and though he reached Lake Victoria Nyanza, he had suffered so much from fever and other diseases due to the climate that he was reluctantly compelled to retrace his steps to the coast and return to England. He brought with him a small collection of plants, and in connection with two of them his name will remain associated with African Botany: Mr. Baker named a new *Asplenium A. Hanningtoni* (Journ. Bot. 1883, 245), and Dr. Masters associated his name with a pretty little passion-flower (*Tryphostemma Hanningtonianum*), (Ic. Plant. t. 1484), which he collected at Kwa Chiropa. After a short residence in England his health was so thoroughly restored that his medical advisers assured him that he might return to Africa without any special anxiety as to the climate. He was consecrated a Bishop of the Church of England, and shortly afterwards he returned to Africa, visiting on his way Palestine and Upper Egypt. He reached Mombasa in the end of January, 1885. Though the duties of his office fully occupied his time, he yet in his frequent journeys found opportunities of observing and collecting plants. He sent home a small collection of Mosses, which are in the hands of his friend Mr. Mitten to work out. In his expedition to Kilimanjaro he collected some plants, which the rain afterwards soaked and destroyed. He was delighted to meet on the mountain with *Sibthorpia europæa* and *Arthrolobium ebracteatum*. He determined that there were certainly two entirely distinct species of *Hydnora* in the district in which he travelled; perhaps these and other plants may yet reach England. He resolved to visit the missionaries at Lake Victoria Nyanza, and by the end of October he had got within three days of Uganda, the city of Mwanga, the successor of King Mtesa. Mwanga had been alarmed at the news of the Germans taking possession of some land on the eastern shores of Africa, and thought the approach of a great chief from England threatened the safety of his kingdom. The Arab traders encouraged the King in his belief, and the missionaries failed to convince him to the contrary. The King sent messengers to arrest the bishop; and after being detained a prisoner for eight days he was, by order of Mwanga, murdered on October 30th, with his whole party, except four of his porters, who have since reached Mombasa and confirmed the sad story. W. Carruthers.



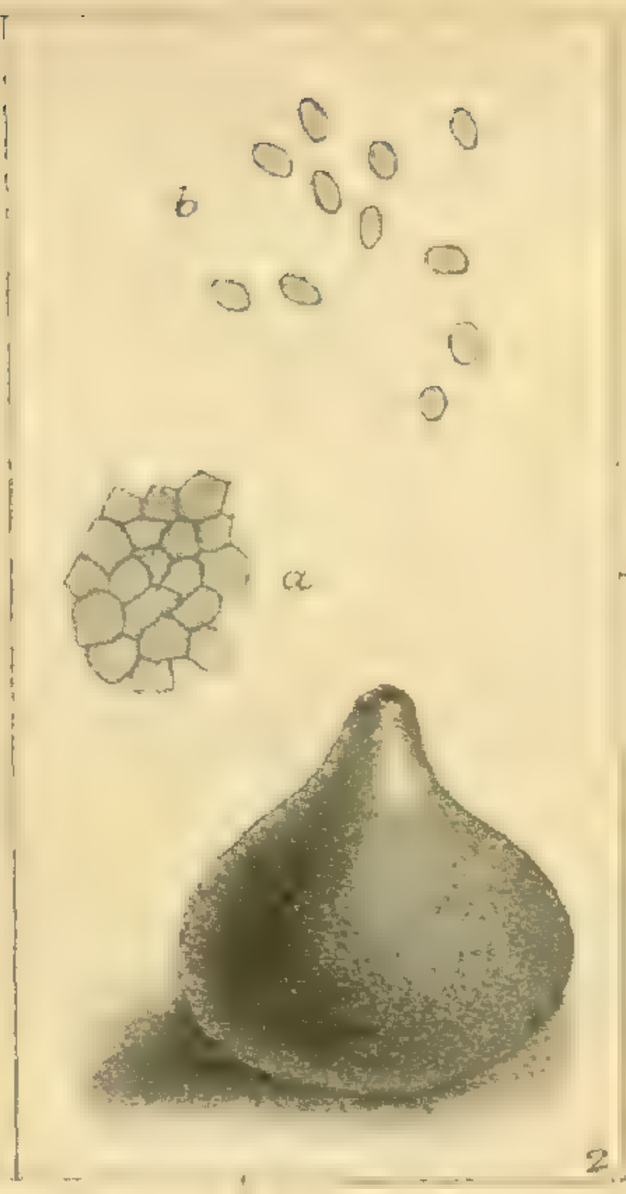






W B G del.
R Morgan lith
West Newman & Comp

1

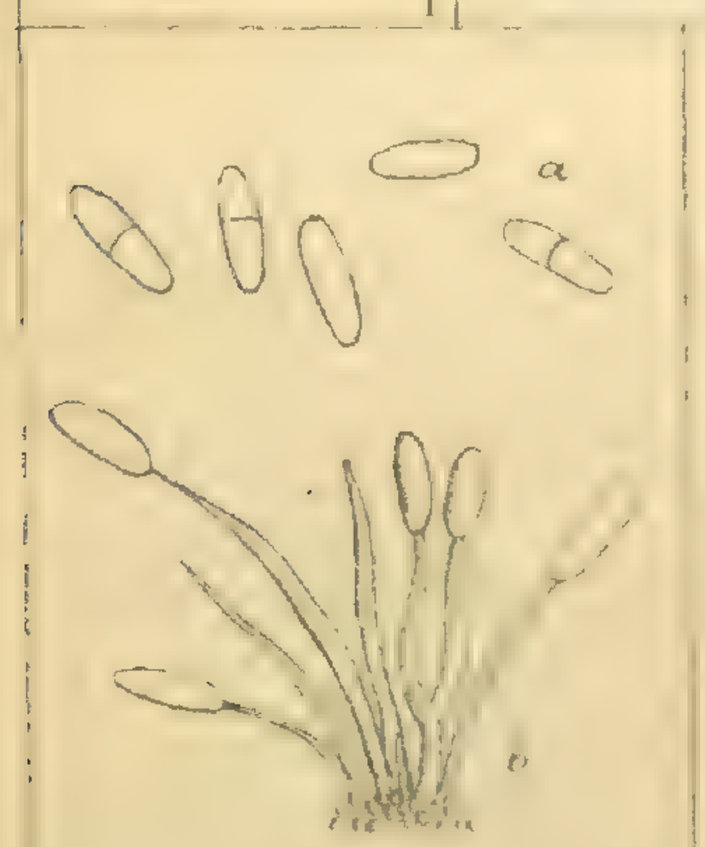


2

3

4

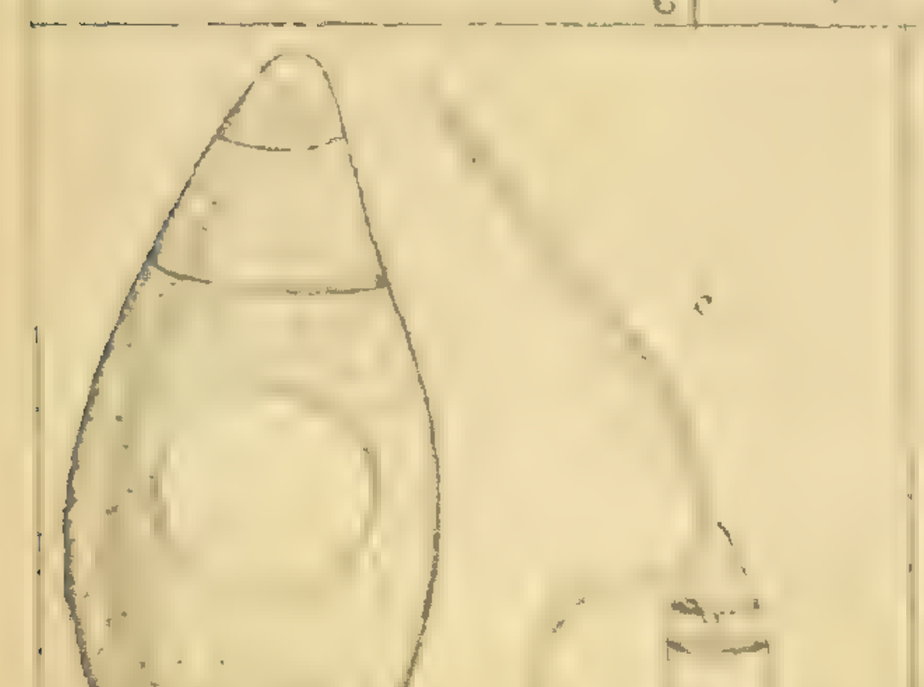
5



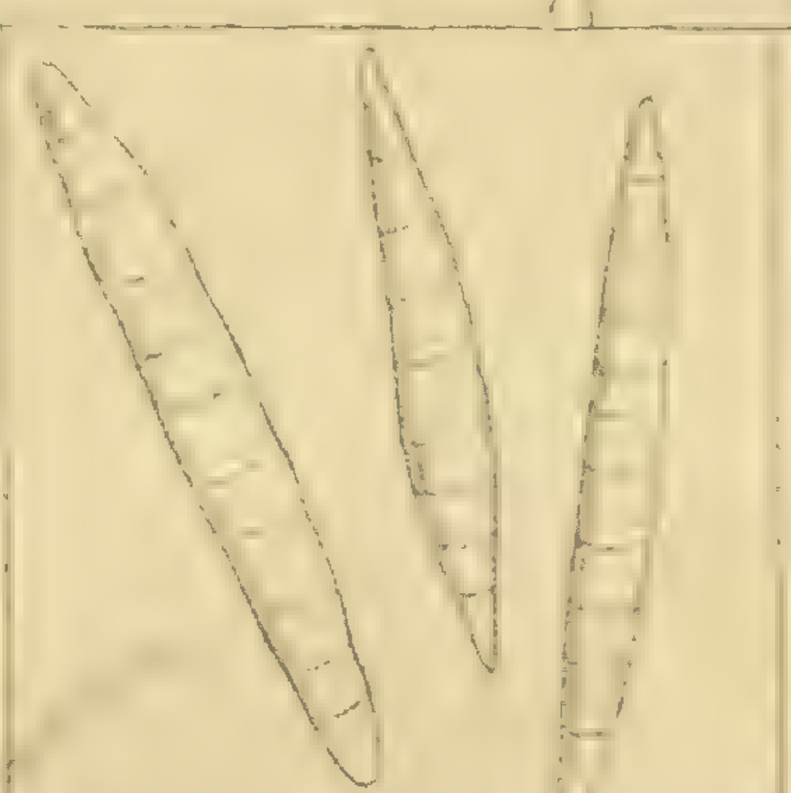
6

7

8

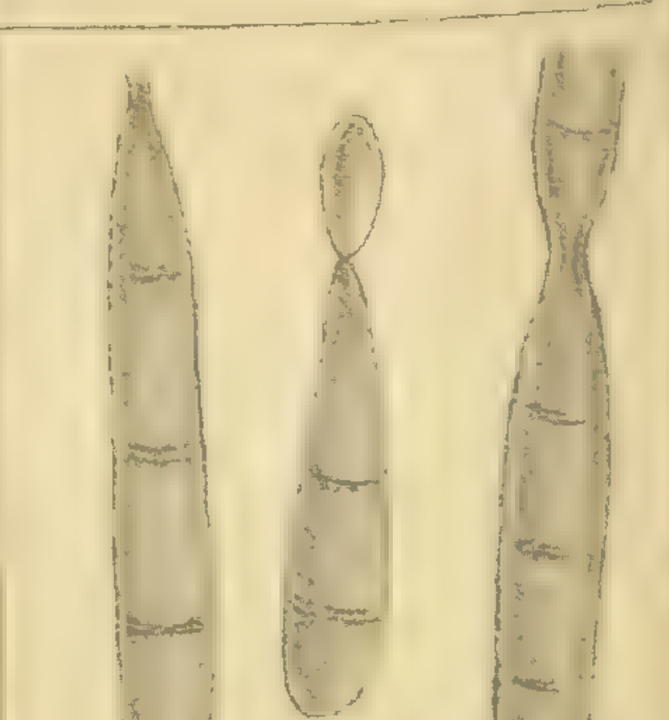


9



10

11



12

W B. G. del
R Morgan lith

West, Newman & Co. imp

NEW OR NOTEWORTHY FUNGI:—Part III.

By W. B. Grove, B.A.

(Plates 266 & 267).

The paper on which the following list is founded was read before the Birmingham Natural History and Microscopical Society, December 1st, 1885. Since that time additions have been made to it, however, more than doubling its extent. I should like again to express my continued obligations to Mr. W. Phillips, Shrewsbury, for his ever ready and kindly help in answering all the questions on the identification of species which I have put to him.†

**Agaricus* (*Myc.*) *electicus* Buckn. Fung. Brist. iv. 2, t. ii. f. 2 (1881); Cooke, Illustr. t. 249 c.

On dead rush-stems, Sutton Park (Wk.), June. Agreeing with Bucknall's figure.

**Agaricus atro-rufus* Schæff. Fr. Hym. Eur. p. 300.

Pileus 1 in. across, subumbonate, somewhat fleshy, convex, brittle, rugose when dry, smooth, hygrophanous, plum-coloured, then purplish tan. Gills adnexed, ascending, slightly sinuate, not crowded, purplish umber; edge white, crenulate. Spores elliptic, somewhat acute, dark purple-brown, 12–15 μ × 6 μ; cystidia numerous. Stem $2\frac{1}{2}$ in. × $\frac{1}{6}$ in., white, shining, with a faint purplish tinge, equal, smooth, fibrilloso-pruinose above, a few fibrous roots at base.

Amongst grass, Sutton (Wk.), December. The description given above was drawn up from some specimens which Dr. Cooke refers to this species, and figures in the 'Illustrations,' pl. 571. They differ from Fries's description in a few particulars, mainly in the attachment of the gills, and are probably distinct.

75. *Mucor racemosus* Fres. Beitr. p. 12, t. 1, f. 24–31 (1850); Sacc. Mich. i. 438 (1878); Bainier, Mucor. pp. 17–20, t. i. f. 6–11 (1882).

Stem 5–10 mm. high, forked with long branches, or racemose with few short patent scattered branches; each branch and stem terminated in a single small globular sporange, 30–80 μ diam., which is at first milk-white, then yellow, then rusty yellow, and finally brownish grey. Sporangial membrane thin, yellowish, smoothish, not diffluent till quite mature; columella obovate, occasionally roundish, with remains of sporange at base. Sporidia spherical, seldom oval, hyaline, 7–11 μ diam., but occasionally (in small sporangia) as low as 4 μ.

On rotting starchy substances, Birmingham, with *M. Mucedo*. Easily distinguished by its sparsely branched stem and rusty

† A small number of dried specimens are being prepared for publication, under the title "Fungi Bromvicenses Selecti," in half-centuries; no species will be inserted except those mentioned in this series of papers. Applications for these sets, the number of which is very limited, to be made to the author.

sporangia. Bainier figures echinulate zygospores, 73–84 μ diam. No doubt often found, but confounded with *M. ramosus* Bull. owing to the meagre description, in the 'Handbook,' of the latter, which is represented by Bulliard with numerous *panicled* branches.

76. *Mortierella polycephala* Coemans, Hyph. Nouv. (1863); Van Tiegh. Rech. sur les Muc. p. 93 *seqq.* t. 24, f. 80–89 (1873); Bainier, Mucor. p. 103–4 (1882). — *M. crystallina* Harz, Neue Hyph. p. 58, t. i. f. 2 (1871).

Stems in dense white scattered tufts of 20 or more, erect, straight, perfectly hyaline and smooth, not granular, swollen below, attenuated and cylindrical above, 250–400 μ high, terminated in a single sporange, about 40 μ diam.; a little below the sporange are 2–4 (rarely 5 or 6) erecto-patent branches, sometimes subverticillate or opposite, more often scattered, but not remote; branches short, cylindric-subulate, sporangia smaller than terminal one. Sporidia subspherical, rather angular at times, perfectly hyaline, 10–12 μ diam., 50–80 in a sporange.

On *Hypnum*, dung, &c., Edgbaston (Wk.), Oct. At the base and on the moss were numerous whitish yellow "chlamydospores," spherical, covered with short blunt spines, supported on very short or longer cylindrical pedicels, 20–21 μ diam. — probably *Sepedonium mucorinum* Harz (*l. c.* p. 23).

77. *Gymnoascus ruber* Van Tiegh., Bull. Soc. Bot. Fr. (1877); Winter, Pilze, ii. 16 (1884).

Tufts of hyphæ 1 mm. broad, at first bearing conidia; hyphæ irregularly branched, entangled, having thin walls covered with numerous scattered warts. They afterwards bear at the lower part roundish asci, which are 10–12 μ diam. and 8-spored. Sporidia conglobate, circular in front view, elliptic in side view, 4·5–5·5 μ diam. Every part of the fungus is of a bright sealing-wax red colour.

On dog's dung, Hereford,* Dec. to March. The asci are at first concealed by the tufts of hyphæ, but at length exposed.

78. *Gymnoascus Reesii* Baranetzky, Bot. Zeit. (1872); Winter, Pilze, ii. 15 (1884).

This is similar to the preceding, except in colour, and has smaller asci and sporidia. I include it here with a little uncertainty, as I could find only two or three specimens; the tufts were of a yellowish brown colour, about 1 mm. diam.; the hyphæ dirty yellowish brown, much branched and anastomosing, with thick walls, smooth outside, but the inner contour wavy, with numerous septa; the asci roundish, 7–9 μ diam.; the sporidia discoid, 4 μ diam., and of a pale brown colour.

On dog's dung, Hereford, Dec. With the preceding.

---

* This and the other fungi (except one) mentioned in this paper from Hereford grew on a portion of dung which I picked up there during the Fungus Foray, 1885, and on my return kept moist under a glass shade. It is worthy of note that none of them appeared until the matrix had been so preserved for about two months.

79. *Valsa cincta* Fr. S. V. S. p. 411 (1849).—*Sphæria cincta* Fr. S. M. ii. 387 (1822)—non *V. cincta* Currey.

Stroma rather large (2–3 mm. diam.), attenuated from an oval base into a roundish or more often elliptic disc, pustulate and emerging through transverse clefts of the epidermis, closely adherent to the outer bark, usually surrounded (when seen in horizontal section) by a black line; perithecia 6–12 in each stroma, surrounding a central spermogonium, globose, prolonged upwards into a thick neck about as long as the perithecium itself; disc dirty white or more often brownish, surrounded by the projecting globose largish black ostiola, which are pierced by a conspicuous pore; asci clavate or oblong, attenuated below, 8-spored, 60–80 μ × 9–10 μ; sporidia biseriate, large, allantiform, hyaline, rounded at each end, 14–26 μ × 4–5 μ.

On branches of damson, Sutton Coldfield (Wk.), Feb. This is not the variety on *Prunus domestica*, mentioned by Fckl. (Symb. M. Nach. i. 316).

**Lentomita ampullasca* mihi, Sci. Gossip, p. 76, f. 48–53 (1886).—*Sphæria ampullasca* Cooke, Handbk. p. 876, fig. 395 (1871). —*Ceratostomella ampullasca* Sacc. Syll. i. 409 (1882).

Agreeing with Cooke's description except in the sporidia, which are tristichous, oblong-fusiform, somewhat curved, appendiculate at each end, then with a large guttula at each extremity, finally constricto-uniseptate, and with a guttula also on each side of the septum. Tip of ascus crenately bilobed within. Sporidia 12·5–14 μ × $2\frac{1}{4}$ μ.

On inner surface of barb of *Acer pseudo-platanus*, Sutton Coldfield (Wk.), Dec. to Feb. This is certainly the fully-developed form of Cooke's species, the form of the asci being exactly as in his figure. On the outer surface of the same bark identical perithecia occurred in small dense oval pustules, which burst through the epidermis. These were probably not different from *Sphæria stylophora* B. & Br., except in the slightly longer beaks: the former must then be called *L. stylophora* var. *ampullasca*.

Note.—I have since paid another visit to the sycamores on which the *Lentomita* was growing, and found specimens still more valsoid in character, but having the perithecia and sporidia in all respects identical with those of the scattered form. As is suggested to me (*in litt.*) by the illustrious Professor Saccardo, these are probably *Diaporthe Hystrix* (Tode), while the more scattered specimens which I first described are *Diaporthe Hystricula* S. et Speg. I have seen no specimens of these, but, if so, the synonymy would be as follows:—

Diaporthe Hystrix Sacc. Fung. Ven. iv. 6 (1875).

Forma *valsea*:—*Sphæria Hystrix* Tode, Fung. Meck. ii. 53, f. 127 (1791). — *Sphæria stylophora* B. & Br. Ann. N. H. No. 976, t. 17, f. 29 (1861).—*Lentomita stylophora* Sacc. Syll. i. 586 (1882).

Forma *subsparsa*:—*Sphæria ampullasca* Cke. Hndb. p. 876, f. 395 (1871). — *Diaporthe Hystricula* S. et Sp. Mich. i. 392 (1878).—*Ceratostomella ampullasca* Sacc. Syll. i. 409 (1882). — *Lentomita ampullasca* Grove, Sci. Goss. p. 76 (1886).

80. **Eriosphæria inæqualis,** sp. (?) n.—E. peritheciis ovoideis, ca. 150 μ diam., dense confertis, superficialibus, parte inferiori pilis brevibus rigidis radiantibus obsitis, superiori nudis, prominulis, rugosiusculis, nitidis; ostiolo conico, pertuso; ascis stipatis, cylindricis, 50 μ long., subinde basi attenuatis et tum 70–80 μ long., 3–4 μ crass.; sporidiis monostichis, oblongis, 7–8 $\mu \times 2\frac{1}{2}$–3 μ, inæqualibus, hyalinis, 2–3-guttulatis, maturis tenuiter 1-septatis, loculo superiori ovoideo 1-guttulato, inferiori angustiori at longiori, conico-attenuato, 2-guttulato, loculis demum facile secedentibus.

In ligno putri, una cum *Gonytricho cæsio* Nees, "Barnt Green" (Ws.), Aug. *Sphæriæ pilosæ* Cke. Handbk. p. 860, manifeste affinis, et teste icone Curreiana (Linn. Trans. t. 57, f. 21) vix nisi sporidiis inæqualibus differens. Cum *Trichosphæria pilosa* Sacc. Syll. i. 452, comparanda, et præsertim cum ejusdem var. *nitidula* (*ibid.* ii. Add. xxxiv.), quæ probabiliter status juniores viderentur. *E. inæqualis* saltem varietas esse alterius-utrius reperietur.

81. *Melanomma longicolle* Sacc. Fung. Ven. Nov. iii. 5 (1875); Fung. Ital. 293 (1878); Mich. i. 449 (1878), ii. 417 (1882); Syll. Fung. ii. 113 (1883).

Perithecia loosely gregarious, adnate to the bare wood or semi-immersed, subglobose, $\frac{1}{5}$–$\frac{1}{4}$ mm. diam., black, shining; ostiolum cylindrical, about equal to the perithecium in length, somewhat thickened at the apex, where it is conical and minutely perforate; asci cylindric-clavate, 90 $\mu \times 15$ μ, somewhat attenuated below; paraphyses numerous, filiform; sporidia 8, biseriate, oblong-fusoid, 20 $\mu \times 7$–$7\frac{1}{2}$ μ, straight or slightly curved, 3-septate, scarcely constricted, 4-guttulate, dusky olive.

On bark of *Acer pseudo-platanus*, Sutton Coldfield (Wk.), Feb. The perithecia are at first hidden, then emergent, and then surrounded at the base by the laciniæ of the bark, phacidium-like. The thickened apex of the ostiole is usually very marked. The paraphyses are at first much longer, and at all times somewhat longer than the asci. Sporidia, when young, hyaline and uniseptate, with two guttulæ in each loculus; sometimes they become coloured whilst still only uniseptate, sometimes 3-septate and still hyaline. The guttulæ ultimately disappear.

82. **Sporormia brassicæ,** sp. n. — S. peritheciis gregariis, magnis, usque ad $\frac{1}{3}$ mm. diam., globosis, atris, lævibus, nitidis, ostiolo minute papillato obsoleto, inter fibras nidulantibus, demum pæne superficialibus; ascis subfasciculatis, aparaphysatis, clavatis, 50–60 $\mu \times 15$–18 μ (part. sporif.), infra in stipitem filiformem ascum æquantem v. paulo breviorem 2–3 μ crassum attenuatis, apice rotundato; sporidiis tristichis v. inordinatis, infra monostichis, linearibus, tetrameris, olivaceis, dein fuscis, 25–35 $\mu \times 4$–5 μ, loculis duobus interioribus oblongis, truncatis, 5–7 μ long., exterioribus subconicis v. oblongis, 8–10 μ long., difficile secedentibus.

In caulibus *Brassicæ oleraceæ* putrescentibus, Streetly (St.), Oct. Asci et perithecia iis *S. octomeræ* similia, at illi cum sporidiis fere duplo minores. (Tab. 266, fig. 1).

83. *Cryptoderis riparia* (Niessl) Sacc. Syll. ii. 230 (1883); *Gnomonia riparia* Niessl Neu. Kern. 47 (1874).

Perithecia scattered, immersed beneath the cuticle, afterwards emerging, globular, somewhat depressed, at length collapsing, black, smooth, shining, prolonged into a subulate or cylindrical beak, a little longer than the perithecium, subpellucid at apex. Asci clavato-fusiform, 25–32 μ × 5–6 μ, 8-spored; sporidia distichous, oblong, subclavate, hyaline, 10–11 μ × $2\frac{1}{2}$ μ, obtuse, uniseptate (immature), 4-guttulate, somewhat curved or unequal-sided, slightly constricted at the septum, which often divides the spore into two unequal parts.

On the lower part of stems of *Epilobium hirsutum*, standing in water, Harborne (Ws.), Nov. The original specimens of Niessl had 4-spored asci, but in other respects closely resembled mine.

85. *Gibberella cyanogena* Sacc. Syll. Fung. ii. 555 (1883).—*Sphæria cyanogena* Desm. Ann. Sc. Nat. x. 352 (1848).—*Botryosphæria cyanogena* Niessl. Beitr. p. 47 (1872).

Perithecia crowded, oblong, 150–200 μ diam., at length collapsing at the conical obtuse apex and umbilicate, plicate and verrucose, dirty amethyst-blue; asci clavate, obtuse and rounded at summit, 8-spored; sporidia fusiform-oblong, sometimes straight and inequilateral, at others gently curved, obtusely rounded at each end (the nucleus very pale violet), 3-septate, scarcely constricted, 25–32 μ × 7 μ; mycelium branched, effused, crustaceous, yellowish; conidia sometimes solitary, sometimes clustered, lunulate-fusiform, apiculate, 1–3 (more rarely 5) septate, subhyaline.

On rotting stems of cabbage, Ireland (*H. W. Lett*).

84. *Nectriella chrysites* Sacc. Mich. i. 278 (1878); Syll. ii. 450 (1883).—*Nectria chrysites* West.

On twigs and small branches of ash, Middleton (Wk.), April. It is not without a little uncertainty that I refer my specimens to this species, since the asci were imperfectly developed. But the habitat, the form of the perithecia, the rich golden colour of the tissues, and a few unseptate *free* spores found in each perithecium examined, all point to this conclusion. The perithecia occurred in erumpent clusters of 4–16, were globose or more often pyriform, golden, then brownish, deeply umbilicate at the apex, about 250 μ diam.; asci clavate, young.

**Lophiotrema angustilabrum* Sacc. Mich. i. 338; Fung. It. 238 (1878); Syll. ii. 687 (1883).— *Lophiostoma angustilabrum* B. & Br.; Cke. Handbk. p. 850.

On nettle-stem, Middleton (Wk.), April. See 'Science Gossip,' 1886, pp. 35–7, figs. 31–4, where it is shown that *Lophiostoma sexnucleata* Cooke (*ibid.*) is identical with this species. *Lophiotrema scrophulariæ* (Peck) appears to be closely similar, but smaller.

86. *Niptera Riccia* Sacc. Myc. Ven. Spec. p. 162, t. xvi. f. 3–6 (1873); Fung. Ven. Nov. iv. 33 (*status spermogonicus*).

On dead wood, Sutton Coldfield (Wk.), Sept. Resembles some of the large forms of *Niptera cinerea* Fckl., from which, according to Mr. W. Phillips, it is not really distinct. I am not quite of this opinion. The deeply-lobed margin, like that of *Riccia glauca*, and

the greyish yellow subsulcate disc I have never seen in any specimen of the latter species, at any rate so strongly marked. The size, reaching 4–5 mm., was also a striking feature.

87. *Dermatea nectrioides* Phill. *in litt.*
On cones of *Pinus sylvestris*, Barnt Green (Ws.), Sept.

**Propolis pyri* (B. & Br.). — *Stictis lecanora* S. et K., var. *pyri* B. & Br.; see 'Grevillea,' v. 62.
On dead branches of pear-tree, Sutton Coldfield (Wk.), Dec. to Feb. Mr. W. Phillips considers my specimens to be identical with this species.

88. **Phyllosticta stephanoti,** sp. n. — P. maculis rotundatis v. irregularibus, albidis, linea angusta atro-fusca cinctis; peritheciis epiphyllis, numerosis, sparsis, atris, lenticularibus, depressis, papillatis, $\frac{1}{4}$ mm. diam., ostiolo epidermidem perforante; sporulis oblongis, utrinque rotundatis, 12–16 $\mu \times$ 4–5 μ, hyalinis. (Tab. 266, fig. 3).
In foliis *Stephanoti*, "Sutton Coldfield" (Wk.). Apr. A *Phoma asclepiadearum* West. differt peritheciis sporulisque multo majoribus.

89. *Phoma delitescens* Sacc. Syll. iii. 105 (1884). — *Sphæria delitescens* Wallr. Fl. Crypt. p. 777 (1833).
Perithecia delicate, rounded, at first immersed, pale translucent-brown, shining through the epidermis, becoming black, bursting the epidermis in radiating fissures. Sporules imperfect.
On the lower surface of leaves of box, Hampton-in-Arden (Wk.), Aug. Probably only an early stage of *Phoma Mirbellii* (Fr.) Sacc.

90. *Phoma hysterella* Sacc. Mich. ii. 275 (1881); Syll. iii. 102 (1884).
Perithecia subcutaneous, here and there a few, linearly aggregated, surrounded by the epidermis, which is split in *Hysterium* fashion, globular, papillulate, black, $\frac{1}{5}$ mm. diam.; sporules obovate, 10–11 $\mu \times 7$ μ, slightly acute at base, with a large guttula (several, *Sacc.*), hyaline.
On dead leaves of *Taxus baccata*, Hampton-in-Arden (Wk.), Aug.

91. *Phoma ilicicola* Sacc. Syll. iii. 106 (1884). — *Sphæropsis ilicicola* C. et E. Grev. vi. 3, t. 96, p. 28 (1877).
Perithecia amphigenous, gregarious, globular, black, shining, erumpent: epidermis laciniate. Sporules ovoid, hyaline, 9–12 $\mu \times 4\frac{1}{2}$–5 μ.
On holly-leaves, Hampton-in-Arden (Wk.), Aug. Distinguished from *P. ilicis* Desm. (besides the spores) by the fact that the epidermis is split by the erumpent perithecia, whereas in the latter the epidermis is merely pierced by the ostiolum.

92. *Phoma lineolata* Desm. Not. Ann. Sci. Nat. xvi. 298 (1851); Sacc. Syll. iii. 150 (1884).
Perithecia innato-erumpent, black, small, connate in short lines, pierced, at length surrounded by the split epidermis; nucleus white; sporules ovoid or oblong, expelled in a cirrus, 5–7 μ long, on short basidia.
On larch-cones, Hampton-in-Arden (Wk.), Aug.

93. *Phoma pithyophila* Sacc. Syll. iii. 101 (1884).— *Sphæronema pithyophilum* Corda, Ic. iv. 41, f. 116 (1840).

Perithecia roundish, emergent, subconfluent, black. Sporules oblong, obtuse at each end, but somewhat more acute at the base, colourless, but filled with granules and therefore subimpellucid, at length hyaline, having a small clear space (guttula) about the middle of one side, and sometimes, but rarely, two guttulæ; expelled in an oblong globule or longer cirrus, which is whitish or yellow. Sporules 25–30 μ × 8–9 μ.

On pine-cones, King's Norton (Ws.), Aug. My specimens agreed with Corda's figure, but occurred on the cones, not, like his, on the leaves of *Pinus sylvestris*.

94. *Aposphæria inophila* Sacc. Syll. iii. 175 (1884). — *Phoma inophila* Berk. (1853); Cke. Handbk. p. 421.

Var. Pseudo-platani mihi. — A. peritheciis effusis, gregariis v. paucis connatis, maxime variis, præcipue globosis, vix v. distincte papillatis, atris, rugosis, 80–160 mm. diam., inter fibras cinerascenti-dealbatas solutas sericeo-nitidulas nidulantibus, tandem superficialibus, collabescentibus, poro pertusis; sporulis oblongis v. ovoideis, bi- v. non-guttulatis, singulis hyalinis, coacervatis luteolis, 4–5 μ longis.

In truncis *Aceris pseudo-platani* decorticatis, "Sutton Coldfield" (Wk.), Jan.—March. A typo sporulis 2–3-plo longioribus distincta.

95. **Coniothyrium rostellatum,** sp. n. — C. peritheciis globosis rostello brevi cylindrico instructis, v. ovoideis rostro confluente, $\frac{1}{6}$–$\frac{1}{3}$ mm. diam., $\frac{1}{4}$ mm. alt., superficialibus, atris, rugulosis, sparsis v. subinde duobus semiconnatis; contextu sub microscopio parenchymatico, olivaceo, subpellucido; sporulis numerosis, ovoideis v. subglobosis, olivaceis, 4 μ × 2$\frac{1}{2}$–3 μ. (Tab. 266, fig. 2).

In interiori squamarum superficie conorum *Pini sylvestris* "King's Norton" (Ws.), Aug. *C. dispersello* affine, at rostro manifesto distinctum.

96. *Diplodia hederæ* Fckl. Symb. Myc. p. 395, t. ii. f. 35 (1869); Sacc. Syll. iii. 344 (1884).

Perithecia scattered or collected in small groups, erumpent, roundish or elliptical, $\frac{1}{3}$–$\frac{1}{2}$ mm. broad, black; texture parenchymatous, blackish, almost opaque; ostiolum conical, pertuse, piercing the epidermis, which is longitudinally rimose and sometimes blackened. Sporules oblong, rounded at each end, at first continuous, hyaline, with 1 or 2 guttulæ, then uniseptate, the septum often arcuate, and dividing the spore unequally, at length dusky olive, 24–30 μ × 10 μ.

On shoots of ivy, King's Norton (Ws.), Aug. Externally resembling *Coniothyrium hederæ* Desm. The sporules ooze out, and form at the mouth of the perithecium a globule, which is white when they are immature, but afterwards brown.

97. **Staganospora ilicis,** sp. n. — S. peritheciis hypophyllis, sparsis v. subinde binis-ternis congregatis, atris, globoso-lenticularibus, epidermide poro exiguo pertusa velatis; sporulis exiguis,

cylindraceo-fusoideis, utrinque subacutis, 3-septatis, hyalinis v. coacervatis dilutissime olivaceis, 14–17 (vel usque ad 20 μ) × 2–3 μ. (Tab. 266, fig. 4).

In foliis *Ilicis Aquifolii*, "Warley Woods" (St.), April.

98. *Rhabdospora inæqualis* Sacc. Syll. iii. 580 (1884). — *Septoria inæqualis* Sacc. et Roum. Reliq. Lib. iv. No. 156, t. xliv. f. 30 (1884).

Perithecia densely gregarious, innato-erumpent, depressed-globose, extremely unequal, scarcely papillate, black, $\frac{1}{4}$ mm. diam.; sporules fusoid, acute at each end, curved, continuous, hyaline, 15–18 μ × 3 μ; basidia filiform, very long, varying, 20–40 μ × 2·5 μ, hyaline.

On smooth bark of *Sorbus Aucuparia*, Harborne (Ws.), March. My specimens had the perithecia somewhat shining, but varying much in size and form, slightly papillate or not at all; the sporules agreed exactly with the figure quoted. The basidia are fasciculate or subramose at the base, often swollen in the middle, averaging double the length of the sporules or more.

99. *Rhabdospora pleosporoides* Sacc. Syll. iii. 538 (1884). — *Septoria* (?) *pleosporoides* Sacc. Mich. i. 128 (1878).

Spots none; perithecia scattered, veiled by the epidermis, globose-depressed, $\frac{1}{2}$ mm. diam.; ostiolum short, papillate; sporules filiform, straight or curved, 38–50 μ × 1–1$\frac{1}{2}$ μ, continuous, obsoletely guttulate, hyaline.

On old stems of *Rumex Acetosa* from nests of terns, Farne Islands, in the collection of Mr. R. W. Chase, of Birmingham. The perithecia resemble in size and habit those of *Pleospora herbarum*.

COLLONEMA, gen. nov.*

Genus e Sphæroideis scolecosporis. Perithecia subglobosa, subcarbonacea, superficialia. Sporulæ longæ, cylindricæ v. fusoideæ, continuæ, hyalinæ.

Est Aposphæria scolecospora. Eodem sunt attribuendæ *Sphæria hemisphærica* A. et S., et *Sphærocista schizothecioides* Preuss.

100. **Collonema papillatum,** sp. n. — C. peritheciis minutis, gregariis, atris, globosis v. subovatis, basi ligno insculptis, dein liberis, sursum in papillam conicam pulchram poro exiguo pertusam attenuatis, rugosis, ·08–·13 mm. diam.; nucleo albo, arctissime conglutinato; cirro longissimo, tenuissimo, filiformi; sporulis fusoideis, utrinque longe attenuatis, acutissimis, curvulis, eguttulatis, hyalinis, 18–19 μ × 2$\frac{1}{2}$ μ. (Tab. 266, fig. 5).

In corticis *Aceris pseudo-platani* pagina interiori, "Sutton Coldfield" (Wk.), Dec.—Jan., socio *Graphio penicilloide* Cord. Sporulæ aqua diu suffusa difficillime tamen solutæ.

Description of Plates.

Tab. 266.—Fig. 1. *Sporormia brassicæ*, unusually short-stemmed ascus × 500; *a*, free sporidia × 500. 2. *Coniothyrium rostellatum*, perithecium × 100; *a*, cells of perithecium × 250; *b*, sporules × 500. 3. *Phyllosticta stephanoti*, sporules

---

* **Κόλλα, glue, and νῆμα, a thread.**

× 500. 4. *Staganospora ilicis*, sporules × 650. 5. *Collonema papillatum*, perithecium with issuing persistent tendril, *in sicco*, × 150; *a*, sporules × 1000. 6. *Pseudodiplodia corticis*, *a*, free sporules × 500; *b*, sporules still attached to basidia × 500. 7. *Pestalozzia fibricola*, conidia × 1000. 8. *Geotrichum roseum*, *a*, conidia × 500; *b*, basidium with chain of spores × 100. 9. *Dactylella ellipsospora*, *a* × 150; *b*, conidium × 1000; *c*, germinating conidium × 300. 10. *Dactylella fusiformis*, conidia × 500. 11. *Septocylindrium chætospira* × 150; *a*, conidia × 500. 12. *Septocylindrium pallidum* × 750.

Tab. 267.—Fig. 1. *Bactrodesmium caulincola* var. *pellucidum* × 80; *a*, conidia × 500. 2. *Acrothecium xylogenum*, *a*, apex of hypha × 500; *b*, conidia × 1600. 3. *Stachybotrys dichroa*, *a* × 150; *b*, apex of hypha × 1000; *c*, conidia × 1000. 4. *Helminthosporium parvum*, *a* × 150; *b*, apex of hypha and conidia × 500; *c*, conidium × 1000. 5. *Helminthosporium anglicum* × 300. 6. *Helicosporium albidum*, *a*, unusually branched stems × 500; *b*, attached conidium × 500; *c*, conidium × 1000. 7. *Dactylosporium brevipes*, *a* × 80; *b*. hypha and conidia × 500. 8. *Dendrodochium citrinum*, *a*, vertical section × 50; *b*, hyphæ × 1000; *c*, conidia × 1000.

(To be continued.)

GEORGE JACKSON, F.L.S.

By James Britten, F.L.S.

The following account of this botanist is given by Sir J. E. Smith in Rees's 'Cyclopædia,' under the name *Jacksonia*; and it may be worth noting that short biographies of botanists are often to be found in that work, not as independent articles, but under the genera named in their honour:—

"*Jacksonia*, so named by Mr. Robert Brown, in memory of the late Mr. George Jackson, F.L.S., a man of the most excellent and amiable character, devoted to the science of botany, to which, under the auspices of his patron and friend, A. B. Lambert, Esq., he has rendered several important services. The improved style of the Botanical Repository, for some time past, though far short of what he wished, is owing to his care, and he has furnished a paper in the Linnæan Society's Transactions, as a new genus of Decandrous Leguminous Plants, named *Ormosia*. Many manuscripts evincing his learning and scientific skill remained in the hands of Mr. Lambert. Mr. Jackson died of a rapid decline Jan. 12, 1811, aged 31, and was interred on the 16th in St. George's burying-ground, Mary-le-bone. He was a native of Aberdeen. . . . . Two species [of *Jacksonia*] are defined in an unpublished sheet of the third volume of the *Hortus Kewensis*, kindly communicated to us by Mr. Brown, that the memory of his friend might as soon and as widely as possible be commemorated."*

This is the only account of Jackson published, so far as I have been able to ascertain; and some further details regarding him may be of interest. He was elected Fellow of the Linnean Society on Feb. 2nd, 1808, his place of residence then being, as Dr. Murie kindly informs me, Swallow Street, London.

---

* Brown does not, however, refer to him in establishing *Jacksonia* (Ait. Hort. Kew. ed. 2, iii. 12).

Although the paper on *Ormosia** above mentioned is the only one with which his name is associated, it seems probable that some of the work of which Lambert was the ostensible author may be attributed to Jackson, who is styled by Salisbury, writing in 1820, "Mr. Lambert's late factotum."† I cannot, however, find any reference by Lambert to Jackson's services, although those of his successor, David Don, are suitably acknowledged.‡

The connection of Jackson with Andrews's 'Botanists' Repository' seems to have extended from the latter part of vol. vii. to that of vol. x.—from 1807 until his death. The first reference to Lambert's Herbarium is on t. 534 (vol. viii.), although living plants sent by Lambert had been previously acknowledged by whoever wrote the descriptions in the 'Repository.§ Jackson's part in the work seems to have been well known to his contemporaries: thus Salisbury, referring to a statement in the 'Repository' (t. 803) that *Vanilla planifolia* had been mistaken by him for *V. aromatica*, says: "That late excellent botanist, Mr. Jackson, who had the care of Mr. Lambert's herbarium, was so hurt upon seeing the paragraph that he called immediately to assure me he was not the author of it";‖ and he quotes Lambert as the authority for the name.

Smith¶ attributes to Jackson, no doubt correctly, the foundation of the genus *Peliosanthes*, and in this he is supported by Salisbury.** Subsequent authors, however, have, in accordance with the received rules of botanical nomenclature, cited Andrews as the authority for the name, it having been published as if established by him; for Jackson's connection with the 'Repository' was never made public in that work.

Haworth, another of Jackson's contemporaries, also knew of his connection with the 'Repository,' but his reference to it is not complimentary to Jackson. Writing of *Mesembryanthemum præpingue*, he quotes doubtfully the plant so named in Bot. Repos. t. 540, and proceeds:—

"The second edition of Hortus Kewensis cites the above figure of Bot. Repos. (described I believe by the late Mr. Geo. Jackson) for this species, but it has nothing to do with my *M. heterophyllum*; which indeed is not even hinted at by the writer, lest his pirated account from my Miscellanea (p. 101) of the opening and closing of the ripe capsules of Mesembryanthema, and the consequent providential distribution of their seeds, should be exposed. This is like Mr. J.'s asking and obtaining the favour of my telling him where the rare *Agrostis littoralis* grew wild (at a time when I was

---

* The genus was founded (Trans. Linn. Soc. x. 358 (1810) on two plants in Lambert's Herbarium, and a third, referred to *Sophora* by Swartz, of which a drawing by Plumier existed in "the Sherardian collection at Oxford." Of this and other Plumierian drawings, Jackson says he "had taken copies for Mr. Lambert," and the plates illustrating the paper are no doubt his.

† Salisbury's MSS. in Department of Botany, British Museum.

‡ Preface to second edition of 'The Genus Pinus,' p. vi.

§ I hope soon to publish some notes on the contributors to this work.

‖ Trans. Hort. Soc. i. 295 (1812). ¶ Rees's 'Cyclopædia.' ** 'Genera,' p. 63.

the only person who knew a habitat for it); and soon after giving it to Kew garden (where it was shown *me* for a rarity), as a discovery of his own; and also to Sowerby, who figured it in English Botany as a *discovery* of Mr. J.'s; notwithstanding I had given specimens, and even a written new specific character of it to Sowerby himself, above a year before! Not so Mr. Knapp, who, wanting it for his large work on British Grasses, also applied to me for its place of growth; where he found it, and has becomingly acknowledged who enabled him to do so."*

A comparison of the two descriptions of *Mesembryanthemum*, while it does not preclude the possibility of Haworth's charge of piracy being true, does not convincingly establish it; and as Jackson begins his description by saying, "Of this fine *Mesembryanthemum* we have found no figure nor description," it seems likely that he was unaware that the name *heterophyllum* had been preoccupied by Haworth, and employed it in the belief that his plant was the type of a new species. A certain animus is also visible in Haworth's reference to the figure of *Agrostis littoralis* (*Polypogon littoralis* Beauv.) in 'English Botany.' He says it was figured "as a *discovery* of Mr. J.'s"; but the E. B. text simply states "That in the annexed plate was gathered by Mr. George Jackson, in August, 1803, near the powder magazine 4 miles from Woolwich." A note on Sowerby's original drawing explains the reason why Haworth's specimens were not used. It runs thus: "Agrostis littoralis *triaristata Haworth. Specimen by Mr. Hancock about 3 years ago not fit to draw, who said it can scarce be the Ag. littoralis Withg.* Mr. Jackson gathered it near the powder magazine about 4 miles from Woolwich, August 4, 1803." The italicised portion is crossed through. In Smith's hand is added: "With^{gs} plant is Phleum crinitum."

Pfeiffer,† quoting "*Jacksonia* Rafin. in Desv. Journ. Bot. ii. p. 170," adds in a footnote, "dicat. G. Jackson, botanico anglico." No doubt the subject of this sketch is intended, but I do not know how Pfeiffer ascertained the fact, as Rafinesque in the paper cited —a characteristic 'prospectus' of a never-to-be-issued work— merely says, "*Jacksonia trifoliata*, *Cleome dodecandra* L."

THE DISTRIBUTION OF *POTAMOGETON* IN BRITAIN.

By Arthur Bennett, F.L.S.

In this list 134 Counties and Vice-counties are recorded additional to the 2nd edition of 'Topographical Botany,' nearly all the result of two years' work: a result sufficiently gratifying to place on record in the hope that other botanists will work not only at this genus, but at aquatics in general. They are easily preserved, and a large number will go into a small space, so that they are not the encumbrance in journeys that many other genera are. Much yet

* Revis. Plant. Succul. 223 (1812). † 'Nomenclator.'

remains to be done, not only in the field, but among old herbaria, ere we can say we have an approach to completion among our aquatics. Any information on this genus, however slight, will be gratefully acknowledged. The names and sequence are those of 'Top. Bot.' J. B. = Journal of Botany; R. C. = Record Club Report.

Potamogeton densus.

58 Chester. H. Searle sp.

77 Lanark. Gourlie in herb. Trin. Coll. Dublin!

P. pectinatus.

26 Suffolk west. Druce R. C. 83.
84 Linlithgow. Balfour in Edinburgh herb.!

P. flabellatus.

29 Cambridge. Fryer sp.
31 Hunts. Fryer sp.
32 Northton. T. Kirk in Edinburgh herb.!
37 Worcester. Mathews J. B. 1884, p. 40.
54 Lincoln north. H. Searle sp.

P. filiformis.

52 Anglesea. Rev. H. Davies 1798!
83 Edinburgh. Glasgow herb.!
88 Perth mid. Sturrock sp.
96 Easterness. Groves sp.

P. trichoides.

26 Suffolk w. "Skepper." Trimmer in Supp. Norfolk Flora.

P. pusillus.

32 42 53 57! 74 87! 88! 98! 100!

P. mucronatus.

6 Somerset n. Waterfall sp.
7 Wilts north. R. C. 81–2.
16 Kent west. Hanbury herb.!
24 Bucks. Druce, J. B. 1881, p. 252.
25 Suffolk east. Druce R. C. 83.
26 Suffolk w. Herb. G. C. Druce!
28 Norfolk west. Druce R. C. 83.
33 Gloster east. Reader ms.
59 Lancashire s. C. Bailey sp.
62 York n.e. Wilkinson sp.!
63 York s.w. Johnson R. C. 83.

P. obtusifolius.

37 Worcester. Towndrow sp. (confirm.).
69 Westmoreland. Roper sp.
72 Dumfries. Fingland sp.
92 Aberdeen s. Dr. Trail sp.

P. acutifolius.

32 Northton. Druce J. B. 1880, p. 116.

P. zosterifolius.

22 Berks. Druce sp.
24 Bucks. Druce J. B. 1881!
30 Bedford. Saunders sp.
32 Northton. Druce herb.!
40 Salop. Beckwith sp.

P. crispus.

2 Cornwall e. M. Rogers J. B. 1882, p. 104.
4 Devon north. Evans R. C. 81–2.
42 Brecon. Barrett J. B. 1885, p. 111.
43 Radnor. Ridley J. B. 1881, p. 173.
74 Wigton. Druce!
86 Stirling. Coles sp.
83 Haddington. "H. Scott" Edinburgh herb.! (confirm.).

P. perfoliatus.

26 34 42 79! 84! 96!

P. lucens.

34 Gloster west. Reader ms.

P. decipiens.

17 Surrey. Beeby sp.
29 Cambridge. Fryer sp. A. Bennett sp.

31 Hunts. Fryer sp.
32 Northton. Druce!
38 Worcester. Bromwich sp.
53 Lincoln south. Beeby sp.
88 Perth mid. Sturrock & Dr. White!

P. prælongus.
24 Bucks. Beeby.
28 Norfolk west. Fryer sp.
31 Hunts. Fryer sp.
32 Northton. Druce!
48 Merioneth. Parsons R. C.!
04 Ebudes north. S. Grieve!

P. heterophyllus.
94 Banff. W. F. Miller sp.
95 Elgin. Craig Christie sp. (confirm.).

P. nitens.
17 Surrey. Straker sp. (*fide* Dr. Tiselius).
52 Anglesea. Herb. Dillenius, Oxford!
92 Aberdeen s. Trail & Roy J. B. 1884, p. 242.
08 Sutherland west. Hanbury & Fox sp.

P. Zizii.
17 Surrey. Beeby sp.
29 Cambridge. Fryer sp.
31 Hunts. Fryer sp.
39 Stafford. Douglas. herb. Trin. Coll. Dublin! (as *prælongus*).
40 Salop. Beckwith sp.
55 Leicester. Hanbury herb.!
53 Lincoln south. Beeby sp.?
84 Berwick. Renton!
89 Perth east. Sturrock!

P. rufescens.
21 Middlesex. Crespigny!
28 Norfolk west. W. M. Hind sp.
32 Northton. Herb. A. G. More!
39 Stafford. H. Searle sp.
53 Lincoln south. Edinburgh herb.!
74 Wigton. Druce!
87 Perth w. B. White!
00 Clyde Isles. G. E. Hunt in herb. Dr. Moore!

P. natans (seg.).
4 Devon n. M. Rogers J. B. 1882, p. 15.
5 Somerset south. Murray sp.
6 Somerset n. Waterfall sp.
16 Kent west. Ar. Bennett sp.
31 Hunts. Fryer J. B. 1884, p. 107.
33 Gloster east. Reader sp.
37 Worcester. Mathews J. B. 1884, p. 40.
38 Warwick. T. Kirk in herb. Edinburgh!
42 Brecon. Barrett J. B. 1885, p. 111.
43 Radnor. Ridley J. B. 1881, p. 173.
45 Pembroke. Ridley!
55 Leicester. Mott herb.!
57 Derby. Hind herb. Trin. Coll. Dublin!
65 York north-west. Percival sp.
74 Wigton. Druce.
76 Renfrew. Nicholson com. sp.
84 Linlithgow. A. Craig Christie sp.
87 Perth west. J. B. 1884, p. 274.
91 Kincardine. Trail & Roy J. B. 1884, p. 242.
93 Aberdeen n. Druce herb.!
98 Argyle. C. Bailey sp.
06 Ross east. R. C. 81–2.
07 Sutherland east. Grant sp.

P. polygonifolius.
4 Devon north. R. C. 81–2.
6 Somerset north. Murray sp.
23 Oxford. Druce R. C. 83.
42 Brecon. Barrett J. B. 1885, p. 111.
44 Carmarthen. Glasgow herb.!
57 Derby. J. G. Baker.
60 Lanc. west. C. Bailey R. C. 81–2.
73 Kirkcudbright. Druce.

74 Wigton. C. Bailey sp.
97 Westerness. E. F. Linton sp.
05 Ross west. C. Bailey!
06 Ross east. Druce J. B. 1882, p. 357.

P. plantagineus.
36 Hereford. A. Ley!
72 Dumfries. Herb. Dr. B. White!
80 Roxburgh. Brotherston R. C.

ON *SPARGANIUM NEGLECTUM.*

By W. H. Beeby.

During Dr. Nordstedt's visit to this country last year, I had the pleasure of showing him the two forms of *Sparganium* included in the *S. ramosum* Huds., and described in this Journal, 1885, p. 193. Since his return Dr. Nordstedt has drawn my attention to an interesting paper on the same subject by Dr. A. Mori, Director of the Botanic Gardens, Modena, and published in the 'Proc. Verb. della Soc. Toscana di Sci. Nat.' for January, 1882, an abstract of which is given in Just's 'Bot. Jahresber.,' 1882, ii., p. 85. From Dr. Mori's observations it was at once evident that he had remarked the two plants at a date earlier than they had been observed by myself, and I take this opportunity of expressing my regret that I should have overlooked his article. I have since sent ripe fruits to Dr. Mori, and he has replied that they correspond with those of the two forms found by him in Tuscany; and further, that he has not published any name in connection with them. Both the above-named botanists speak of the fruit of *neglectum* as being that most usually described under the old name, but, however that may be, I have followed the oldest ascertained authority in my application of the name *ramosum* in the restricted sense. I am unable to give the exact date of Curtis's plate ('Flo. Lond.,' fasc. 6, pl. 342), but I believe it would be about the year 1798.

All the information yet obtained goes to show that *S. neglectum* has much the more southern range of the two plants. It extends southwards to Algiers, whence I am indebted for ripe fruit to M. Lloyd, of Nantes, who also sends the same from Charente Inférieure, and Vendée, France. In England its northern limit is reached in the Midlands, the extremes being Warwick, Stafford, and Salop. All the specimens received from counties north of the above have proved to be imperfect or immature states of *ramosum*. The latter appears less common in South Europe, as M. Lloyd's communications do not include it; and Dr. Mori's paper shows it to be rare in Tuscany, although he records having met with it near Massarosa, while, as already pointed out, it is the northern form in this country. The British distribution, as shown by specimens seen by myself, is as follows:—

Sparganium ramosum Curtis. — Dorset, *R. P. Murray*; Sussex East!; Surrey!; Oxford, *G. C. Druce*; Norfolk East, *H. T. Mennell*; Cambridge, *A. Fryer*; Hunts, *A. Fryer*; Gloster West, *H. P. Reader* (com. *Fryer*); Worcester, *R. F. Towndrow*; Warwick, *J. E.*

Bagnall; Stafford, *J. Fraser;* Salop, *W. E. Beckwith;* Yorks N.W., *F. A. Lees;* Westmoreland, *Miss E. Hodgson* (Hb. Mus. Brit.); Cumberland, *W. Hodgson;* Stirling, *A. G. Kidston* (com. *G. Nicholson*); Perth Mid, *F. B. White* (com. *Ar. Bennett*); Aberdeen North, *J. W. H. Traill* (com. *Ar. Bennett*).

S. neglectum Beeby.—Hants South, *R. P. Murray;* Sussex East, *H. T. Mennell;* Surrey!; Oxford, *G. C. Druce;* Norfolk East (Flordon Fen, fruit imperfect), *H. G. Glasspoole* (com. *A. Bennett*); Worcester, *R. F. Towndrow;* Warwick, *J. E. Bagnall;* Stafford (fruit quite abortive), *J. Fraser;* Salop, *W. E. Beckwith.*

Mr. Beckwith could not find *S. neglectum* in Salop until I drew his attention to the station whence there is an immature specimen in Hb. Mus. Brit. (leg. *Leighton*). I have seen no specimens from Ireland, but have seen *S. ramosum* from several Irish counties.

I think that old records of *S. ramosum* may be safely applied to the *S. ramosum* Curtis, for Watson's Province IX., and for all numbers above that. For the lower numbers the distribution will require working out for both plants, although in Provinces VII. and VIII. *ramosum* will be the common form, and likely the only one in several of the counties comprised within those Provinces.

S. ramosum in particular, and *S. neglectum* to a lesser extent, produce large quantities of fruit that is not matured, being either apparently merely not ripened; or quite abortive, no seed being enclosed. During the past autumn I have paid much attention to these forms, some of which are perplexing. The imperfect fruits of *ramosum* do not attain their full form, and when dry and shrivelled much resemble the immature fruits of *neglectum*. Further, in these immature fruits the stigma itself is nearly always persistent, and, as the beak and stigma are indistinguishable in the dry state without the aid of a glass, the persistent stigma of imperfect *ramosum* makes the fruit appear long-beaked, thus increasing the first-sight resemblance to *neglectum*. The perianth-scales are variable in these imperfect fruits, though I believe their form is constant in the typical, well-ripened fruit of both plants. I have not found wild seedlings of either plant, nor have I been able to grow either from seed, and think that they rely largely for extension on the strong soboles. Intermediate states are certainly scarce, and I have not yet seen any that I should consider such, all forms yet seen being, in my opinion, referable either to one plant or the other. After many observations made with the special object of ascertaining the facts in this respect, in which I have received able assistance from my friend Mr. Alfred Fryer, I feel quite disposed to concur in the opinion expressed by him some time ago, *viz.*, that "all *ramosum* that properly ripens its fruit is *good ramosum.*" I may add that, although the beak of the fruit is shorter in *S. ramosum*, the stigma is longer than in *S. neglectum*, for pointing out which character I am indebted to Mr. N. E. Brown. I have to thank my various correspondents for the specimens kindly communicated, and venture to hope that with their assistance many of the gaps in the distribution of the two plants may soon be filled up.

ON THE FLORA OF THE UPPER TAMAR AND NEIGHBOURING DISTRICTS.

By the Rev. W. Moyle Rogers, F.L.S.

(Continued from p. 110).

Hyoscyamus niger L. I. "Bude, &c." (Hind and Mrs. Kennedy).

Verbascum Thapsus L. I. Frequent. III. Bridgerule. Tinney. —*V. Blattaria* L. I. Tintagel (Hind). Alien.

Scrophulariâ Balbisii Hornem. I. and II. Common. It no doubt occurs in the other districts, though I think sparingly, as I have no records and have several times looked for it in vain. — *S. nodosa* L.

Digitalis purpurea L.

Antirrhinum Orontium L. I. Bude (Hind). III. Bridgerule Vicarage garden, casual weed (1882 only).

Linaria Cymbalaria Mill. Alien or denizen. Frequent. — *L. Elatine* Mill. — *L. vulgaris* Mill.

Mimulus luteus L. Alien. I. Trebarwith, stream lined on both sides for nearly half a mile.

Sibthorpia europæa L. I. Abundant in the Minster Valley, on the hill above Boscastle, and in the Valley of Rocks. St. Knighton's Kieve (Keys' Fl. Dev. and Cornw.).

Veronica hederifolia L. — *V. polita* Fries. — *V. agrestis* L. — *V. Buxbaumii* Ten.—*V. arvensis* L.—*V. serpyllifolia* L.—*V. officinalis* L. —*V. Chamædrys* L. — *V. montana* L. Locally abundant. I. Kilkhampton (Mrs. Kennedy). Stratton, by stream, in great quantity. Launcells, by stream below church. Minster Valley. III. Parnacott. Bridgerule. Tetcott. IV. Near Bradworthy, on the Sutcombe and Kilkhampton Road. — *V. Anagallis* L. Very rare. I. Bude (Hind) !, by the stream at north-west end of Summerleaze Down, and in ditches by the river, in good quantity.— *V. scutellata* L. Unusually common. I. Near the Reservoir (type and var. *pubescens*). Tackbeare (*pubescens*). Wainhouse Corner. Greena Moor. II. and III. Quite common in roadside ditches, as well as on moors &c. IV. Between Holsworthy and Thornbury (extreme *pubescens*). Okehampton.—*V. Beccabunga* L.

Euphrasia officinalis L. — Var. *montana*. I. Boscastle Cliffs. II. Moor south of Merrifield. III. Pancrasweek, moor near Holsworthy Road. — Var. *tetraquetra*. I. Frequent along the cliffs from Summerleaze Down to Trebarwith. Remarkably different from *montana* in habit, colour and hairiness, although growing quite near it at Boscastle.

Bartsia Odontites Huds. Vars. *verna* and *serotina* quite common. With white flowers at Wanson Mouth. — *B. viscosa* L. I. Kilkhampton, "lane near Parsonage, &c." (Mrs. Kennedy). Minster and Boscastle Valleys, in plenty. Valley of Rocks. Tintagel (Webb). II. Wilsworthy Moor (perhaps the same as Mr. Baker's "Roadside near Whitstone.")

Pedicularis palustris L.—*P. sylvatica* L.

Rhinanthus Crista-galli L.

Melampyrum pratense L. Only locally common. I. Kilkhampton neighbourhood, not very common (Mrs. Kennedy). Near Stratton, Burrow, and Tackbeare. Week St. Mary, wooded hollow east of village. Minster Valley. III. Clawton, near village. IV. Beaworthy, bushy roadside towards Ashbury, in good quantity for short distance. Okehampton.

Verbena officinalis L. I. "Bude, &c." (Hind). Stratton and Launcells Road, and near Marhamchurch; only a plant or two together. Boscastle, Trevalga, and Tintagel, frequent. III. Near Pyworthy.

Lycopus europæus L.

Mentha rotundifolia L. Native. I. Minster Valley, in great quantity; and elsewhere in the Boscastle neighbourhood. Tintagel (Hind!).—*M. viridis* L. Denizen. III. Bridgerule, "Lower Hill Park," in plenty. — *M. piperita* Huds. Denizen. I. Stream, Summerleaze Down, two or three plants. Bude Canal (Hind). Dr. Hind also gives "*M. piperita sylvestris* Sole. Bude," a form which I suppose to be represented in Lon. Cat. 7 Ed., under *M. pubescens* Willd. — *M. hirsuta* L. — *M. sativa* L. (a. *rivalis* and b. *paludosa*).—*M. arvensis* L.

Thymus Serpyllum Fries. Abundant. Dr. Hind's list contains only *T. Chamædrys* Fries (without locality); but this has not been found by Mr. Briggs or me.

Origanum vulgare L. Only by roadside near Lew Down (III.), and perhaps not native there.

Calamintha Clinopodium Spenn. Rare. I. Trebarwith. III. Parnacott, in one spot. Bridgerule, for a short distance between village and mill. Lifton. IV. Between Soulden Cross and the Reservoir.—*C. menthifolia* Host. I. and II. Fairly common. III. Local. Bridgerule. Holsworthy. IV. Near Soulden Cross. Okehampton.

Melissa officinalis L. Alien. I., II., III. Rather frequent, but always near house or garden.

Nepeta Cataria L. I. Bude (Hind).—*N. glechoma* Benth.

Salvia Verbenaca L. Rare. I. Bude and Boscastle (Hind!); especially abundant on the rocky ground near Forrabury Church.

Prunella vulgaris L.

Scutellaria galericulata L. I. Bude and Marhamchurch (Hind). Marhamchurch, by Canal (Webb). II. and III. Tamar Valley, by canal and river, frequent. Worthen.—*S. minor* L. One of the commonest bog and moorland plants.

Ballota nigra L.

Stachys Betonica Benth. — *S. palustris* L. — *S. ambigua* L. I. Between Launcells and Bridgerule. IV. Sutcombe, sparingly. Okehampton, 1882. This last typical; the others hardly so. In Keys' Fl. Dev. and Cornw. it is stated that there is a specimen of this in Herb. Borrer at Kew from Tintagel. — *S. sylvatica* L. — *S. arvensis* L.

Galeopsis Tetrahit L. — *Leonurus Cardiaca* L. I. Bude (Hind). Alien.

Lamium purpureum L. — *L. album* L. Not seen in I. and II.;

and rare elsewhere. III. Tatson Orchard. Pyworthy Village. Holsworthy, at both ends of town. IV. About Okehampton.—*L. Galeobdolon* Crantz. Only seen near Okehampton (IV.)

Ajuga reptans L.—*Teucrium Scorodonia* L.

Echium vulgare L. I. "Bude, &c." (Hind). The only record for all the districts.

Lithospermum officinale L. I. "Bude, &c." (Hind); in good quantity at north-east end of Summerleaze Down.

Myosotis cæspitosa Schultz. I. Kilkhampton (Mrs. Kennedy!). "Bude, &c." (Hind), Summerleaze Down. II., III., IV. Common. —*M. palustris* With. Rare. Seen only in the Launceston and Kilkhampton Road (II.), in ditches near Whitstone and at Bennicott.—*M. repens* Don. Exceedingly abundant, and far the commonest "Water Forget-me-not" in all the districts.—*M. arvense* Hoffm.—b. *umbrosa*. III. Bridgerule and Tetcott.—*M. collina* Reich. Rare. I. Boscastle and Trebarwith, in small quantity. Possibly elsewhere in this district, and overlooked through disappearing so early in the year.—*M. versicolor* Reich.

Anchusa arvensis Bieb. I. "Bude, &c," (Hind). Fields between Forrabury Church and the sea, abundant.—*A. sempervirens* L. Denizen. I. About Boscastle, in several places. II. Bridgerule, close to village.

Borago officinalis L. I. Denizen. About Boscastle, remarkably abundant.

Symphytum officinale L. I. Between Burrow and Titson. Whitstone. Week St. Mary. Boscastle, in very small quantity; denizen. Valley of Rocks and Trebarwith, rather common and apparently native. Not seen in the other districts.

Pinguicula lusitanica L. Rather common. I. Lord's Meadow, Kilkhampton (Mrs. Kennedy). Greena Moor. III. Between Parnacott and Holsworthy. Bridgerule and Tinney, frequent. Affaland Down. IV. Between Beaworthy and Ashbury, in plenty.

Primula vulgaris Huds.—*P. officinalis* L. III. Bridgerule Vicarage Plantation and fields near; no doubt planted, but increasing.

Lysimachia nemorum L.

Anagallis arvensis L.—*A. cærulea* Sm. I. Kilkhampton (Rev. C. Kingsley, in Jacob's W. Dev. and Cornw. Flora, 1836–7, quoted in Keys' Fl. Dev. and Cornw.).—*A. tenella* L.

Centunculus minimus L. I., II., III. Exceedingly common.

Glaux maritima L. I. Northcot Mouth. Bude (Hind!).

Samolus Valerandi L. I. "Bude, &c." (Hind!). Valley of Rocks. Tintagel. Trebarwith.

Armeria maritima Willd. I. Sea-coast, common.

Statice binervosa G. E. Sm. I. Bude (Hind!), on the "Castle Rock." Boscastle, in plenty. Tintagel (Hind). The Bude and Tintagel localities appear in Keys' Fl. Dev. and Cornw. (as in Dr. Hind's list) under *S. Dodartii* Gir.; but Mr. Keys shows in a footnote that Mr. Watson did not wholly endorse that naming. The plants that I have seen (at Bude and Boscastle) appear to come best under var. ***intermedia***.

Plantago major L. — *P. lanceolata* L. — b. *Timbali*. I. Bude. Introduced. — *P. maritima* L. I. By the sea, frequent. At Tresparrot, more than a mile inland.—*P. coronopus* L. I. Common by the sea, but not seen inland beyond Kilkhampton (Mrs. Kennedy).

Littorella lacustris L. The Reservoir,—in and close to the water, —in plenty on Cornish and Devon sides (II. and III.).

Salsola Kali L. I. Bude (Hind).

Beta maritima L. I. Bude (Hind). Boscastle.

Chenopodium polyspermum L. I. Field near quarry, Tackbeare. Near Wanson Mouth, potato-field. — *C. album* L. — *C. Bonus-Henricus* L. Denizen. I. Between Stratton and Launcells, on rocky bank near farmhouse. Near Forrabury Church, field-border, several. III. Tetcott, not far from churchyard.

Atriplex angustifolia Sm. — *A. erecta* Huds. — *A. deltoidea* Bab. I. Bude. Marhamchurch (Hind!), between Titson and Bune's Hill. III. By Moor Farm cottages. — *A. Smithii* Syme. II. Bridgerule. IV. Okehampton. — *A. Babingtonii* Woods. I. Bude (Hind!). Tintagel.

Rumex conglomeratus Murr. — *R. nemorosus* Schrad., a. *viridis*. Common enough, I think, although I have only two or three localities recorded.—b. *sanguineus*. I. Between Poughill and Bude, in considerable quantity. — *R. pulcher* L. I. Bude. Boscastle, cliffs and valley. — *R. obtusifolius* Auct. — *R. pratensis* M. & K. I. Summerleaze Down, by stream near Launcells. Road near Hoppicott Down. II. Bridgerule, by canal. III. Bridgerule, Pyworthy, and Tinney; in several spots. Roadside near Affaland Down. IV. Near Okehampton, 1882.—*R. crispus* L.—*R. Acetosa* L. —*R. Acetosella* L.

Polygonum Fagopyrum L. I. Stratton (Hind). Casual, no doubt. — *P. Convolvulus* L. — *P. aviculare* L. — *P. Raii* Bab. I. Bude (Hind and Mrs. Kennedy). I have not seen it on this part of the Cornish coast. — *P. Hydropiper* L. — *P. mite* Schrank. is given in Dr. Hind's list (without locality), and *P. minus* Huds. (Kilkhampton) in Mrs. Kennedy's notes; but I have never seen a Cornish specimen of either. Both are queried for the county in Top. Bot. — *P. Persicaria* L. — b. *elatum*. III. Parnacott. — *P. lapathifolium* L. I. Stratton (Hind). Burrow. II. and III. Bridgerule. IV. Okehampton. — *P. amphibium* L., b. *terrestre*. I. Widmouth, abundant. The typical plant not observed anywhere. — *P. Bistorta* L. Denizen. III. Bridgerule, by streamlet in "Church Meadow."

[*Daphne Laureola* L. I have seen this only in a cottage-garden at Bridgerule (II.); but the cottager said that he had brought the bushes (three) from a field near Newacott, where he had found them "wild." It is likely to occur in a few sheltered spots].

Euphorbia Helioscopia L. — *E. Paralias* L. I. Bude (Gibson in Phytol. 1846, quoted in Keys' Fl. Dev. and Cornw.; Hind!).— *E. portlandica* L. I. Bude (Baker!); with the last, but less abundant. — *E. Peplus* L. — *E. exigua* L.

Mercurialis perennis L.

Parietaria diffusa Koch. Rare, except by the sea. I. Boscastle nd Tintagel, in plenty. II. St. Stephen's. IV. Okehampton.

Urtica dioica L. — *U. urens* L. Apparently rare. I. Bude (Hind!). Bossiney.

Humulus Lupulus L. Denizen. I. Fairly common, but usually in small quantity, and never, I think, far from house or garden. II. Bridgerule, by village. III. Bridgerule, Churchyard hedge and road near. Tinney, near farm. IV. Okehampton.

Ulmus suberosa Ehrh. Locally common, but I have no notes of localities (whether as denizen or native).—b. *glabra*. IV. Between Soulden Cross and Reservoir. — *U. stricta*. II. Roadside a little out of Launceston northwards (Baker). — *U. montana* Sm. I. Kilkhampton. Bude. Boscastle. III. Holsworthy. IV. Okehampton.

Quercus Robur L., a. *pedunculata*. Common. — b. *intermedia*. III. Church Meadow, Bridgerule; one old tree. — c. *sessiliflora*. Fairly frequent. I. Bude (Baker). Common near Kilkhampton (Mrs. Kennedy). Stratton and Marhamchurch Road. Near Wanson Mouth. II. Between canal and river, north of Bridgerule. Whitstone (Baker!). III. Near Reservoir, many. Fields about Bridgerule Bog, in plenty. Near Holsworthy, on the Thornbury Road. IV. Sutcombe and Kilkhampton Road. Between Beaworthy and Ashbury.

Fagus sylvatica L. Denizen. Locally abundant.

Corylus Avellana L.

Alnus glutinosa L.

Betula alba L. All three vars. are common.

Myrica Gale L. Rare. III. Upper Bridgerule Bog, in good quantity, 1882. Scotland Bog, a few bushes.

Populus alba L. I. Trevalga (Hind). Probably planted. — *P. tremula* L. Native. Remarkably frequent. I. Bude (Hind). Launcells. Marhamchurch. Tackbeare Lane. II. Bridgerule and Whitstone. III. Near Reservoir. Bridgerule. Pyworthy and Tinney, common. Near Holsworthy. Clawton. IV. Apparently quite common over all the moorland country from the Reservoir to Beaworthy.—*P. nigra* L. Alien. I. "Stratton, &c." (Hind). Launcells.

(To be continued.)

SHORT NOTES.

Botany of Caithness and Sutherland. — As promised Journ. Bot. 1885, p. 333), I enclose a few additional particulars. By the Wick river we found a *Carex* growing with *C. salina* b. *kattegatensis*, which proves to be *C. aquatilis* var. *cuspidata* Læstd. The Hieracia referred to in the paper, after being seen by Mr. Backhouse, Prof. Babington, and Mr. Baker, who all considered they did not agree with our hitherto known British types, were sent to Dr. Almquist, of Stockholm; and among them are *H. norvegicum* Fr., *H. pallidum* b. *Schmidtii* Tausch, *H. murorum* b. *crassisculum* Almq., and c. *basifolium* Almq. A Polygala from the limestone hillocks about Durness, in Sutherland, proves to be *P. calcarea* F. Schultz: this

is an extraordinary extension of its hitherto restricted southern distribution. On our journey south we gathered on the Little Culrannoch, in Forfarshire, *Carex rigida* var. *inferalpina* Læstd., and in the Cairngorms a *Cerastium* which Mr. Backhouse had found many years before and to which he drew my attention, and which has been identified, with a query, by Professor Lange as his *Cerastium arcticum;* but ripe seeds are wanting before he can speak with absolute certainty. All the above names have been inserted in the new edition of the 'London Catalogue,' which will be published during the first week in May.—Frederick J. Hanbury.

Carex helvola Blytt in Britain. — While examining my specimens of *Carex curta* var. "*alpicola* (Wahl.)," for the purpose of comparing them with the *C. vitilis* of Fries, I was struck with the habit of one so named for Lochnagar, which I received from the Edinburgh Herbarium when Mr. F. M. Webb was Curator. On dissecting a spike, and comparing with type-specimens, it seemed to agree with *C. helvola* Blytt, although decidedly less luxuriant. I divided the specimen and sent half to Dr. Blytt, and he wrote, "The *Carex* is no doubt *C. helvola*, though scanty; it will be well to gather it at Balfour's station." The label runs thus:—"*Carex curta* β. *alpicola* (Wahl.). Lochnagar. Aug. 11th, 1846. Prof. J. H. Balfour." This was three years before the description of *C. helvola* appeared in Fries' 'Nya Botanika Notiser' for 1849. Dr. Blytt kindly returned with the specimen others gathered by his father (Dr. F. M. Blytt) at Valders, Norway, the original station. — Arthur Bennett.

NOTICES OF BOOKS.

Gray's Botanical Text-book. Vol. II. *Physiological Botany, by* George Lincoln Goodale, A.M., M.D. (Ivison, New York. 1885. 8vo, pp. xxi. 499, 36; 214 cuts).

Though it does not cover quite the same ground, the series of volumes bearing the title at the head of this notice recals at once Hofmeister's 'Handbuch der Physiologischen Botanik.' While Prof. Asa Gray's volume on 'Structural Botany' is worthy to rank with the series written by Hofmeister, de Bary, and Sachs, this fact has placed Prof. Goodale in the position of having great things expected of his volume—apart from the anticipations suggested by his own good reputation. It may be said at once that, though the present book can hardly be placed on the level of the classical volumes mentioned, yet it does not fall far short of them; and Prof. Goodale may be congratulated on having written much the best book of its kind in the English language, of native origin, if I may say so of an American book. Hitherto a large body of students both in this country and in America have been dependent for information on plant histology and physiology on translations of German text-books which, with of course a few distinguished exceptions, would have been far better left in the language whence they came. The opinion appears to prevail that a text-book of

Botany need only be written in German to deserve the honour of translation, and perhaps it is worth while pointing out that German text-books resemble the heavenly bodies in at least one particular, since they differ widely from each other in magnitude and in other attributes. One may imagine the grave surprise of certain German authors and their friends—particularly their friends—when the news of translation reached them. But far be it from me to say more than a word of caution on this matter, lest the charge of ingratitude be brought. Botany in this country and in America owes the great advance of recent years to the impetus of German work, and the mass of research embodied in such a book as Prof. Goodale's can be at once traced almost entirely to the German original. While so deeply indebted for material, it is nevertheless a distinct mark of progress to find this material in its place in a work of independent arrangement and treatment, such as the present.

The book is divided primarily into two parts, containing the outlines of the histology of phænogamous plants and vegetable physiology respectively. The Introduction contains a short and useful account of the appliances used in histology—microscopes, dissecting instruments, reagents, staining agents, and mounting media. Succeeding chapters deal with the cell, its modifications, tissues, the minute structure and development of the vegetative and the reproductive organs, with a physiological classification of the tissues with respect to the division of labour in the plant, and the mechanics of tissues. Part II., which treats of physiology proper, contains chapters on protoplasm and its relations to its surroundings, the diffusion, osmosis and absorption of liquids, soils and ash constituents, the transfer of water, assimilation, the changes of organic matter, growth, movement, reproduction, germination, and the resistance of plants to untoward influences. The book will thus be seen to cover the whole field of plant histology and physiology, and with a remarkable amount of detail, considering the limits within which it is confined. In fact, one is almost tempted to think more highly of it as a storehouse of information than as a teaching book,—but this, if a fault at all, is perhaps one of the right kind, since the work is intended for advanced students, is excellently arranged, and, further, is provided with an admirable glossarial index. The Practical Exercises given at the end doubtless have their value, and they are well done; but the idea is not, I venture to think, a good one. Such directions are best given personally in the laboratory, though these instructions may be of aid to the teacher. The taint of the examination-paper is not quite absent from them. Of the main body of the book, however, it may be said without hesitation that it consists of the results of accurate and conscientious labour. It is very lucidly written, and though a few phrases strike strangely on British ears, it may be after all that these are more English than ours would be. Of the two parts of the book the second is the better done, and at the same time the more needed. Prof. Goodale deserves the gratitude of all of us for his courage in thus taking so decided a step in advance, and for the labour by which he has made the advance a real one.

The next volume of the series is one in preparation by Prof. Farlow on Cryptogamic Botany, both structural and systematic; and a fourth is promised, dealing with the Natural Orders of Phænogams, their special morphology, and useful products. G. M.

Handbook of Mosses. By J. E. Bagnall. Swan Sonnenschein & Co. 1886. 8vo, pp. 96, 37 cuts. 1*s*.

Few things are more noteworthy of progress in our day than the manner in which the more recondite branches of natural science are made plain and easy to the learner, and at a price which would have astonished the last generation.

One of the most recent bijou manuals, and quite up to the standard of any of them, is Mr. Bagnall's little book on the mosses, which is thoroughly imbued with a genuine love for these elegant little plants, and will no doubt add largely to the roll of young bryologists.

The work is arranged in eight chapters, with a short introduction, and contains also thirty-nine woodcuts intercalated with the text, most of them fairly clear and definite, but a few below the average; and in none do we notice any incorrectness, except in one figure on p. 11, where the leaf of *Ephemerum serratum* is represented nerved, instead of nerveless. The chapters run thus:—I. Appliances required for the study: notes the books on the subject, and optical aids required for examination. II. Development: the spore, protonema, gonidial growth, and structure of the leaves and fruit. A little obscurity occurs in the description of the fruit of *Funaria* (pp. 19–21); the algoid cells do not extend to the columella, but only to the outer wall of the spore-sac. III. Moss habitats: gives an account of the various situations in which mosses grow, and is one of the best in the book, bearing witness to the author's frequent rambles in search of his favourites. IV. Classification: an outline of the tribes, after Berkeley's arrangement. V. Geographical distribution. VI. Cultivation. VII. Uses. VIII. Preparing specimens: this is excellent and practical, and gives information on all the modes by which mosses and their various parts may be most satisfactory displayed, either for the herbarium or as microscopic objects.

The little book is very clearly printed, singularly free from typographical errors, and a credit both to author and publisher.

R. Braithwaite.

List of Seeds of Hardy Annual and Perennial Plants grown in the Royal Gardens, Kew. 1885. 8vo, pp. 58. H.M. Stationery Office. Price 6*d*.

This is a name-list which may be useful to those who know to what order a given plant belongs, though they will not always find it in its proper place; those who do not will have to search through it to find what they want, as there is no index of genera. A contemporary states that it is thirty years since a seed-list was issued at Kew: if so, it was high time there should be a new one. We fear, however, it is intended to take the place of the

Reports which for many years kept the public informed about what was doing in the Gardens, and botanists acquainted with the recent additions to the Herbarium; being at the same time a storehouse of information on matters affecting economic botany. For some years these Reports have been falling further and further behind—that for 1882 not being issued until March, 1884; and it would be no matter for wonder, however much it might be regretted, if even the marvellous energy which is exhibited in all matters connected with Kew should be unequal to the task of undertaking such details as these. It is not for us, however, to do more—we cannot do less—than express our regret at their cessation.

It is much to be lamented that this list should have been issued without some editorial supervision. Among the many able botanists at Kew some one might surely have been deputed to read the proofs. The employment of one type throughout for names, authorities, and distribution shows an imperfect appreciation of the resources of modern typography. The list is indeed anything but a creditable production; the number and variety of the errors which appear on the most superficial inspection have probably never been equalled in a work of the kind issued by a scientific establishment.

This expression of opinion may seem to need some justification, and this it is not difficult to supply. No explanation of arrangement or abbreviations is given; and this in itself is a serious omission. The average gardener or amateur who finds a list beginning "Aconitum barbatum Patr., Siber., etc." may perhaps understand that "Patr." is the abbreviation of somebody's name, and that "Siber." stands for "Siberia"; and he may deduce from this that a similar order is followed throughout. But everyone will not know offhand the meaning of "Podol.," "N. Holl.," "Oriens." or "Orient," "Cosmópolit.," "Cauc. As. Min.," "C. and S. Eur.," "Sinus Kotzebue," "Eur. (B.)," "Austr." (which means Australia, also styled "N. Holl."), "Chatham is.," "N. T. Zone." To one plant is appended "N. Afr. Am. Ind. N. Holl." The printing of the names of authorities is extremely careless: opening quite by chance at p. 50, we find "Gay.," "Ker." and others, always printed thus, as if their names were abbreviated; "Amo. et Campo." is another instance. The kind of abbreviation condemned by DeCandolle ('La Phytographie,' pp. 273, &c.) finds its expression in "Bkr." for "Baker," "Hk." for "Hooker," "B. & R.," and many more. "Boiss." and "Bois." both occur on the same page—the former is preferable. Who "Blnch." is intended to stand for is open to question; it can hardly, however, be considered an abbreviation of Balansa, who (with Boissier) founded the species to which it is appended; "Sep." for "Lep." is on the same page. Elsewhere we find "H. Bh.," "H. Serr.," "Dorrh.," "Stend.," and the like, some of whom we cannot even guess at; this criticism might be applied throughout the work.

It is even more serious to find that the names of the plants themselves are equally unsatisfactory. Without leaving the page open before us, we note that some names have no authority attached. Sisyrinchium Bermudianum is wrong; and what "Iris Xiphioides, Engl. Iris" means we are unable to conjecture; nor is it clear what

is meant by "I. Douglasiana Herb., var. de Santa Cruz." But glancing through the book we note graver inaccuracies. The mode adopted to distinguish between species and varieties is to indent the latter and prefix a — thus:

"Betonica officinalis L., Eur. As.
— alba
— No. 2.
— Var."

According to the Kew list, then, the remarkable names in the following selection are entitled to specific rank:—

"Delphinium Maackianum Rgl.
Monsieur Viola Hort.
moschatum D. C.
Nahamah Hort.
nudicaule Torr. et Gr."

"Myosotis palustris With.
— semperflorens.
Werleigh's Surprise Hort."
"Nicotiana Lebanon tobacco.
Manilla tobacco.
Maryland tobacco."

The little *Asterolinum*, or more properly *Asterolinon*,—at least, so its founders wrote its name,—appears first as "Asterolinum Linum-splendidum L. et T." and then as "A. stellatum Link," its proper title being *Asterolinon stellatum* Hoffm. & Link. "Linaria rediviva L." has clearly strayed away from *Lunaria* in *Cruciferæ* to its present position in *Scrophularineæ*. Such names as "Anirrhinum," "Strammomium," "Lindelophia," "Nonea," "chelidonoides," abound: these are from two opposite pages (pp. 40, 41), from which we have already selected the species of *Myosotis* and *Nicotiana*.

In the *Compositæ*—apparently by a different hand—there is a good deal of synonymy, by means of which a fresh element of confusion is introduced. We are told that "Erigeron strigosum Muhl. (= stenactis [sic] strigosa DC.)." This, we think, would be interpreted by most people to mean that the latter was the correct name, but in the Kew list the reverse is apparently intended; and as we find no entry under *Stenactis*, we do not see what is gained by the printing of the synonymy. This mode—which is at least novel and ingenious—is adopted throughout the order, except when such further elucidations are introduced as "Xanthocephalum gymnospermoides Bth. et Hk., Mexico (= Gutierrezia gymnospermoides, = G. viscosa)."

We should strongly advise the Director of Kew, if he has not already done so, to forbid any further issue of this "seed-list extraordinary," as a contemporary has styled it, and to call in, if possible, the copies already on sale. The groundwork of the list is no doubt sound, and it would be easy to issue a revised edition, in which the numerous and varied abbreviations should be reduced to system and explained, the multitudinous errors of different kinds corrected, an index of genera added, and some variations in typography introduced. The Kew list of seeds will then be worthy to take its place beside those issued by continental gardens, which cannot be said of the copy before us.

The Tourist's Guide to the Flora of the Alps. By Prof. K. W. v. Dalla-Torre. Translated and edited by Alfred W. Bennett, M.A. London: Sonnenschein. 12mo, pp. viii. 392. 5*s*.

Author, editor, and publisher have combined to render this little work in every way attractive. Printed in clear type on thin paper, and bound in red leather, in pocket-book form, it weighs less than five ounces, and is thus really suited for the pocket—which is not always the case with pocket-floras. The descriptions are short, but clear—indeed the book is in every way so good that we hope it will soon run through the present edition, and that a second issue will supply certain deficiencies which are at present noticeable. For unfortunately it is not complete. The author tells us he has excluded "only the commonest and most ubiquitous plants," and the editor "has added a few which he would expect to find in a Flora of this kind"; but the appendix containing the names of those "not described in this work" is sadly too extensive. It seems to us that plants which are common and ubiquitous are just the ones which would first strike the eye and excite curiosity; and as many of these are not British, they would be the first which the English traveller would wish to identify. He would, we fear, be likely to fall into one of two extremes: either to twist the descriptions in the book so as to suit the plant before him (and we all know how easy it is to be misled by book-descriptions), or to discard the little volume as useless for his purpose. The transatlantic botanist, to whom, when visiting Europe, such a work as this might be invaluable, will be in a still worse predicament, as many of our common British plants will be unfamiliar to him.

We hope, therefore, that a second edition will soon be called for, in which these omissions will be supplied. The convenient size of the volume is one of its greatest attractions; but an extra ounce in weight and a slightly increased bulk will not seriously detract from this. At the same time, the somewhat numerous misprints will doubtless be corrected—such as "radicle" and "radile" for "radical." "Leaves with *spring* teeth" (p. 120) is a puzzling generic character; and "terpinnate" does not strike us as an improvement on the ordinary form of the word.

Sir John Lubbock contributes to the 'Nature' Series (Macmillan & Co.) "Flowers, Fruits, and Leaves," being a reprint of his lectures on these subjects. A good deal of information is conveyed in a pleasant readable manner, and the text is relieved by the introduction of numerous illustrations, some of which, however,—such as the Herb Robert on p. 58,—are extremely crude, the one in question being an impossible plant. The "protective resemblance" theory is illustrated by an engraving (from a photograph) of a group of *Urtica dioica* and *Lamium album*. The resemblance is very remarkable: but, to be of any use to either, the two plants should be constantly associated, which we do not think is the case. Nor can we see what *Lathyrus Nissolia* is likely to gain by growing among and closely resembling grass: surely it is more likely that the plant would be cropped with the herbage, from which it can hardly be distinguished,

than that "the leaves would be picked out and eaten if they were more easily distinguishable."

Mr. H. W. S. Worsley-Benison sends us for notice an address on "Charles Darwin," delivered by him in November last before the Highbury Microscopical and Scientific Society. It is a brief but careful summary of the chief events of Mr. Darwin's life, on the lines of Mr. Grant Allen's work; and is marked by that intense enthusiasm with which some of the great naturalist's disciples pay tribute to his memory. Mr. Worsley-Benison deals severely with those who have criticised Mr. Darwin's views, being apparently of the opinion that the use of strong language should be reserved for Darwinians and their friends.

Among the many notices of Prof. Asa Gray which have appeared in the American press during the last six months, none has been more interesting and comprehensive than that which Prof. C. S. Sargent has reprinted in pamphlet form from the 'Sun' newspaper of Jan. 3rd. The summary of the great New World botanist's views on Darwinism is interesting. "He accepted the Darwinian hypothesis with great caution, and with unshaken religious belief. . . . . To him the theory of natural selection was never quite what it was to some Darwinians, and creation without theism could never form any part of his belief. . . . . 'I am,' he has said, 'scientifically and in my own fashion, a Darwinian, philosophically a convinced theist, and religiously an accepter of the creed commonly called the Nicene as the exponent of the Christian faith.'"

New Books.—H. Loret & A. Barrandon, 'Flore de Montpellier' (ed. 2: 8vo, pp. lxxvi. 663: Paris, Masson). — G. Marchese, 'La cultivazione di piante nuove o poche note per la trasformazione agraria' (vol. i.: 8vo, pp. 198: Milan, 2 *lire*). — G. Karsten, 'Uber die anlage Seitlicher Organe bei den Planten' (Leipzig, Engelmann: 8vo, pp. 32, tt. 3). — J. Stevenson, 'British Fungi (Hymenomycetes)' (Blackwood: vol. i.: 8vo, pp. vii. 372: 39 cuts).

Articles in Journals.

Ann. Sciences Nat. (Ser. vii. t. iii. n. 1).—(Mar.). G. Bonnier & L. Mangin, 'Recherches sur l'action chlorophyllienne séparée de la respiration.'— A. Müntz, 'Recherches chimiques sur la maturation des graines.'

Bot. Notiser (Häft 2).—A. L. Grönvall, *Orthotrichum Geraliense*, n. sp.— G. Lagerheim, 'Contributions algologiques à la flore de la Suède.' — R. Tolf, 'Nägra smålandska mosslokaler.'

Bot. Zeitung (Ap. 2, 9). — J. Reinke, 'Photometrische Untersuchungen über die Absorption des Lichtes in den Assimilationsorganen.'—(Ap. 9). F. Kienitz Gerloff, 'Ueber die Bedeutung der Paraphysen.' — (Ap. 16). J. Boehm, 'Ueber die Ursache des Mark- und Blatt-Turgors.' — (Ap. 23). J. Wortmann, 'Theorie des Windens.'

Bull. Soc. Bot. France (Tom. xxxii.: Comptes Rendus 7).—(Mar. 1). E. Cosson, 'Exploration de la Kroumirie Centrale.'— A. Battandier, 'Notes sur quelques plantes d'Algérie' (*Linum*

Aristidis, *Vicia fulgens*, spp. nn.). — A. Deflers, 'Herborisations dans les montagnes volcaniques d'Aden' (*Crotalaria Schweinfurthii*, *Littonia minor*, spp. nn.). — F. Sarrazin, *Amanita muscaria*. — G. Rouy, 'Sur l'aire geographique de l'*Abies Pinsapo* en Espagne.' — G. Bonnier & L. Mangin, 'L'action chlorophyllienne.' — E. Belzung, 'Développement de l'Amidon a l'obscurité.' — P. van Tieghem, 'Sur la structure des Cabombées.' — L. du Sablon, 'Formes singulières de Cucurbitacées.' — L. Dufour, 'Influence de la lumière sur les stomates.' — M. Dourliot, 'Faisceaux médullaires du *Phytolacca dioica*.' — L. Trabut, 'Additions à la Flore d'Algérie (Graminées).'—(Tom. xxxviii.: Comptes Rendus 1. April 1). P. Duchartre, 'Observations sur les vrilles des Cucurbitacées.' — H. Corte, *Cistus laurifolio-salvifolius* ×. — L. du Sablon, 'Observations anatomiques sur la chute des branches du peuplier blanc.' — A. Franchet, 'Sur les espèces du genre *Epimedium*.' — E. Heckel, 'Observations tératologiques.' — D. Clos, 'De la durée assignée a quelques espèces.' — A. Franchet, 'Primula de la Chine et du Thibet' (*P. malacoides*, *P. Forbesii*, spp. nn.).

Bull. Torrey Bot. Club (April).—D. H. Campbell, 'Development of Antheridium in Ferns' (1 plate). — G. Vasey, 'New American Grasses' (*Aristida Reverchonii*, *Stipa Lettermani*, *Muhlenbergia Parishii* (= *M. sylvatica* var. *californica* Vasey, olim), *M. californica* (= *M. glomerata* var. *brevifolia* Vasey, olim), *M. Wrightii*, *Agrostis depressa*, *A. foliosa*, *A. Diegoensis*, *A. Oregonensis*, *Deyeuxia Cusickii*, spp. nn.).

Gardeners' Chronicle (Mar. 27). — W. B. Grove, 'A Fungous Disease of *Eucharis*' (figs. 74–78). — T. Moore, '*Polybotrya Lechleriana*' (figs. 79, 80). — (Ap. 3). R. W. Adlam, 'A Trip to the Polela (Natal).' — *Anemone Fanninnii* (fig. 84). — (Ap. 17). J. G. Baker, 'The Narcissi of the Linnean Herbarium.'—*Picea Breweriana* (fig. 93). — (Ap. 24). M. T. Masters, 'Root-structure and mode of growth in *Primulaceæ* in relation to cultivation' (figs. 102–111, 114–116).—J. G. Baker, 'Synopsis of European Primulas.'

Journal of Linnean Society (Ap. 14). — F. Darwin, 'On the Relation between the "Bloom" on leaves and the distribution of the Stomata.' — H. N. Ridley, 'Orchids from Madagascar' (*Bulbophyllum approximatum*, *B. conchidioides*, *B. ophiuchus*, *B. coriophorum*, *Liparis puncticulata*, *Eulophia macra*, *Aeranthus polyanthemus*, *Mystacidium viride*, *Cynosorchis glandulosa*, *C. aurantiaca*, *C. tenella*, *Habenaria conopodes*, *H. Foxii*, *H. ichneumoniformis*, *Holothrix glaberrima*, *Satyrium gigas*, *Brownlea madagascarica*, spp. nn.) — C. B. Clarke, 'Observations made in a journey to the Naga Hills.' J. Ball, 'Botany of Western South America' (*Griselinia alata*, sp. n.).

Midland Naturalist.—J. E. Bagnall, 'Notes on the Anker Valley and its Flora.'

Notarisia (April).—G. Lagerheim, *Mastigocoleus*, gen. nov. (tab. 1). —A. Borzi, 'Nuove Floridee Mediterranee' (*Nitophyllum carybdaeum*, sp. n.).

Nuovo Giornale Bot. Ital. (Ap. 19).—F. Panizzi, *Polyporus oleæ*, sp. n.—G. Venturi, 'Appunti sopra muschi italiani.' — L. Nicotra,

'Epatiche di Messina.'—A. Jatta, 'Lichenes Italiæ meridionalis.'—A. Mori, 'Ascidio di *Gunnera*.' — A. Piccore, 'Pugillo di Alghe Canariensi.'—O. Mattirolo, 'Svillupo di nuovi Hypocreacei.'

Oesterr. Bot. Zeitschrift (April). —A. Hansgirg, 'Algarum aquæ dulcis species novæ.' — E. Formánek, 'Mahrische Rosen.'

Pharmaceutical Journal (Ap. 10). — W. Kirkby, 'Sandal Wood' (figs. 1–3).

Science Gossip.—W. B. Grove, 'A Sycamore Fungus.'

Scottish Naturalist (April).—G. C. Druce, 'Plants of West Ross.' —J. Stirton, 'On certain Mosses of the genus *Dicranum*.'— E. M. Holmes, 'British Marine Algæ' (2 plates). — J. Stevenson & J. W. H. Trail, 'Mycologia Scotica (Supplement),' (*Camasporium metableticum* Trail, sp. n.).

LINNEAN SOCIETY OF LONDON.

March 18, 1886. — Sir John Lubbock, Bart., F.R.S., Pres., in the chair. — The Hon. and Rev. J. T. Boscawen, Dr. P. Herbert Carpenter, F.R.S., and Arthur E. Gibbs were elected Fellows of the Society. — Dr. Maxwell Masters exhibited a specimen of *Pinus sylvestris* from Chatsworth, showing a large globular mass of short densely branched shoots hanging from the end of a branch. He pointed out that such growths were either the result of injury from mites (*Phytoptus ?*) or from other causes, or that in other cases they resulted from bird-variation. Seedling variations of a similar kind also occasionally occurred. Such forms were the origin of some of the curious dwarf Conifers met with in gardens, such as the Clanbrassil fir. A similar case of dimorphism in the foliage in a species of *Leptospermum* was also shown by Dr. Masters, having been obtained from Baron Ferdinand von Mueller, of Melbourne — Mr. William Fawcett then read a paper on new species of *Balanophora* and *Thonningia*, with a note on *Brugmansia Lowii*. *Acroblastum pallens* Sol., collected on the first voyage of Capt. Cook in Otaheite, placed by Seemann under *Balanophora fungosa* Forst., has been identified with *B. Hildebrandtii* Reichb. f., from the Comoro Islands. The distribution is remarkable, but this *Balanophora* may be found in intermediate spots, as is the case with *Cirrhopetalum Thouarsii*, which is also found in these extreme localities. *B. typhina* Wall., hitherto placed under *B. dioica*, is partly *B. polyandra* and partly *B. indica*. *B. gigantea* Wall. is not *B. globosa* Jungh., as has been supposed, but a species closely allied to *B. indica*. One of Zollinger's plants is described as new, under the name *B. Zollingerii*. *B. decurrens* is a new species from the Philippine Islands. Other new species sent from the Malay Archipelago by Mr. H. O. Forbes are, *B. ramosa*, *B. multibrachiata*, and *B. Forbesii*. A new species of *Thonningia* is founded upon specimens from Madagascar: of a male plant and female capitula in fruit sent to Sir J. D. Hooker, and a female plant in flower sent to the British Museum. The male flower differs from that of *T. sanguinea* (the only species hitherto known) in having a regular 3-lobed perianth, and the female flowers are connected, being like *Langsdorffia* in both respects. The capitula

are sessile with obtuse scales. The anatomical structure of the rhizome is interesting; there is a central sclerenchymatous strand surrounded by four fibro-vascular bundles. Outside these are several scattered sclerenchymatous strands, and an irregular circle of small fibro-vascular bundles, with the wood and bast portions of the bundles reversed. The fruit is similar to that of *Langsdorffia*, with a minute, simple embryo near the apex of the seed. *Brugmansia Lowii* was described by Beccari from buds. His conjecture that it differed from *B. Zippelii* Bl., which has five or six lobes in the perianth, in having 16 lobes, has been confirmed by an open flower sent from Sumatra by Mr. H. O. Forbes.

April 1. — Sir John Lubbock, Bart., Pres., in the chair. — Mr. J.G. Baker exhibited a specimen of *Scolopendrium Delavayi* Franchet, a new species discovered by the Abbé Delavay in the province of Yunnan. — The following communication was then read: Botanical Observations made in a Journey to the Naga Hills (between Assam and Muneypore), in a letter addressed to Sir J. D. Hooker by Mr. C. B. Clarke. Writing from the station of Kohima, 4750 ft. alt., with the mountain peak of Jakpho, 9980 ft. alt., about ten miles distant, he says the country above 5000 ft. is nearly all jungle; Sikkim plants altogether predominate in number of individuals, and make Kohima resemble Darjeeling, not Shillong. He observes that the *Commelinaceæ*, Rubi, *Senecio*, and Ferns, besides other groups, are nearly all identical with those growing in Sikkim, while on the other hand many Khasi plants are conspicuously absent. For example, there are not Khasi balsams, nor *Impatiens chinensis*, nor *Lespedeza*, nor any of the species of the Cheira Sacred Wood, &c. The pines and oaks are an exception; the latter form the great mass of the forests around Kohima, though *Alnus* is abundant, and this sometimes grows an enormous trunk. The Nagas pollard the alder at six feet from the ground, and cut the innumerable sprouts for firewood. Two species of *Diospyros* were collected. The flora is interesting and rich, though there are few new species. Mr. Clarke gives an account of his ascent of Jakpho. Up to 9000 ft. its vegetation is much as on Tonglo. *Lomaria glauca*, a rare form in Khasia, is here plentiful; Rhododendrons come in strong at 8500 ft., and the ridge on the very top is clothed with dwarf bamboo. The levels 5000–7000 ft. on Jakpho are mostly torests of shrubby *Strobilanthes* six to twelve feet high, just as in Sikkim. There are several laurels, and *Ilex Aquifolium* as a tree thirty to forty feet high. The *Convolvulaceæ* are prominent up to 5000 ft. Mr. Clarke's greatest surprise was a *Silene* about three feet high, of straggling habit and few leaves, which grows in the wet jungle near Kohima. — The first part of a communication, of a lengthened and technical character, entitled "Index Floræ Sinensis," or an enumeration of all the plants known from China proper, Formosa, and the Luchu Islands, together with their synonymy and distribution, was introduced by the authors, Messrs. Francis B. Forbes and Wm. B. Hemsley. — A paper was read by Mr. H. N. Ridley, "On the Freshwater *Hydrocharideæ* of Africa and its Islands." A number of new species are described, among which *Blyxa radicans* and *Boothia exserta* are remarkable;

the latter form was obtained by Sir John Kirk on the River Zambesi, near Shuhango, January, 1860. — A paper, "On the Vegetation of the Arctic Regions," by M. Buysman, was read by the Secretary. The author remarks that the flora of Greenland is decidedly Scandinavian in character. Almost all the plants are also found in Lapland, but, notwithstanding the vicinity of America, few belong to the New World; while Asiatic arctic species are rare. Some 378 species of Phanerogams and Cryptogams compose the Greenland flora; of these over 200 are found on the eastern coast, only 7 of these being absent on the western shore; while 170 species are recorded from the western side, the same being absent eastwards. Nova Zemlja and the Island of Waigatz together possess 290 species, and Spitzbergen 117 species. The author enters into particulars regarding the special plants peculiar to the seaboard, and such as are cultivated by the inhabitants both in the open air and under cover. He remarks that the long and continuous summer sunlight and at times intense heat have much influence on the vegetation, despite long and cold winter seasons.

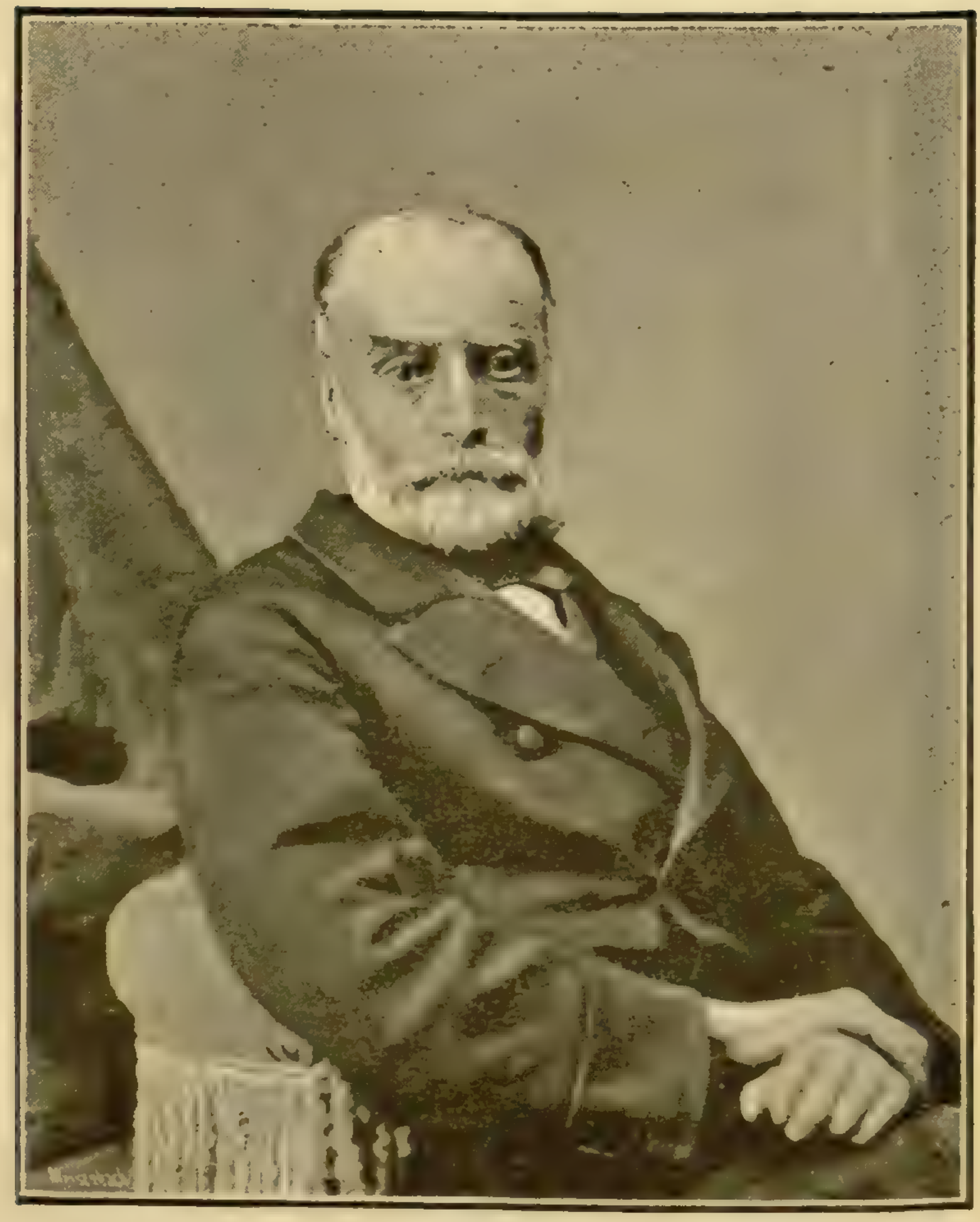
OBITUARY.

The news of the death of the Rev. W. W. Newbould, which took place on April 16th, will evoke a chorus of regret from British botanists, who will feel that a veteran worker and an ever-helpful adviser has been taken from their number. It is fitting that in this Journal, of which since its beginning he has been a constant friend, should be given as complete an account as can be gathered of his connection with British botany; and this will appear in our next issue.

The following tribute, from one of Mr. Newbould's oldest friends, and one for whom he had the highest affection and respect, need not be delayed:—"The death of my very dear friend Newbould is a loss from which I shall not soon recover. He was my oldest intimate friend, and one for whom I had the highest esteem; one whom I could thoroughly trust, and who would have done anything in his power for me. Indeed it was unsafe to express any wish or want in his presence, for fear that he should immediately start to supply it. He was a man who thought nothing of himself or of his labour if he could help another in any valuable or kindly way, or in any work for God or man. Having known him well for more than forty years, I cannot speak too highly of the complete absence of selfishness in him. He has been a great help to me in my scientific work; indeed, to what botanist with whom he was acquainted and who pursued the same branch of study was he not so? His knowledge of British Botany may be said to have been almost unrivalled; and yet he is unknown to the public. All his knowledge of science was used for the help of scientific workers; never for his own credit or reputation. If he had used it for himself or in his own name, no one would have stood higher as a careful observer and scientific botanist. He applied himself chiefly

to the study of our native plants, and either has discovered or been the cause of the discovery of many; and very much information concerning such plants contained in books may be traced back to him. His knowledge was always at the service of others, to be used by them as they thought best, he desiring them to take as little notice of him as possible. All workers amongst British plants will greatly feel the loss of his valuable and ready help in cases of difficulty. But he is gone; and, believing as I do that he was ready to go, his removal ought rather to be a cause for rejoicing; for his life was not altogether a happy one, owing to circumstances which it is not necessary to state here, and which do not in any way concern the readers of this Journal. I cannot better conclude than by quoting a characteristic remark which fell from his lips on September 17th last: 'The longer I live the more I feel that I must sum up all my prayer in the Lord's Prayer, and even more than all in that one clause of it, *Thy will be done*.' — Charles C. Babington."

The death of Randal Hibbert Alcock, which took place last Nov. 9th at Didsbury, Lancashire,—not many miles from Gatley, in Cheshire, where he was born on July 21st, 1833,—deserves a record in the pages of this Journal, of which he had for many years been an attentive reader. During the greater part of his life he lived at Bury, in Lancashire, where he carried on the business of a cotton manufacturer; this he abandoned in 1882 and went to Didsbury. Of quiet and retiring disposition, he was a man of much general information, and an excellent letter-writer; at one time he took a prominent part in public matters affecting the town, and was appointed a magistrate of the borough on its incorporation in 1876. For many years—during most of his life, indeed—he took a keen interest in natural history, and especially in botany. In 1868 he was mainly instrumental in founding the Bury Natural History Society, of which he was President until he left the town, and in which he always continued to take much interest: he drew up the list of plants, published in the Society's Report, which is noticed in this Journal for 1872, p. 277. He was always much interested in the working-men naturalists of Lancashire and Cheshire, and encouraged them in every way; and his wish to help them was the origin of his 'Botanical Names for English Readers,' published in 1876 (see Journ. Bot. 1876, 158), in which he explained the meaning of all the botanical names in use in our floras, prefacing the volume with a carefully-executed and interesting History of Botany. This work gave an impetus to the classical studies of which he had always been fond, and, his health at this time being much impaired by attacks of bronchitis, he devoted himself more thoroughly to these. He soon began the preparation of a 'Flora of Vergil,' the MS. of which is practically complete; and was a frequent contributor of notes on natural history and other matters to the Manchester papers. His death occurred somewhat suddenly, from congestion of the lungs. Mr. Alcock was elected a Fellow of the Linnean Society on Dec. 7th, 1876; he was also a member of the Botanical Exchange and Botanical Record Clubs.



Lucien Jones

W. W. Rees Cordell

WILLIAM WILLIAMSON NEWBOULD.

There are happily still many among us whose names are prominently associated with the botany, not only of our own islands, but of the world at large: but it may be doubted whether any of these would be more widely missed or more generally lamented by British botanists than he who was laid to rest in Fulham Cemetery on the 20th of last April, in the presence of a few of his brother workers—Messrs. Baker, Boulger, Glasspoole, B. D. Jackson, Reeves, and myself. "We could have better spared a better man" is the feeling with which many will have heard of the death of "W. W. Newbould," as he was wont to sign himself; and it is in the belief that those whom he has helped will be glad to have a full account of the botanical career of one whose nervous modesty would not allow him to publish the results of his careful observations, that this sketch is penned. There is a special fitness in its appearance in these pages; for this Journal has, from its beginning, had no more appreciative or constant friend than him to whom the following pages are consecrated. I have received much help in its compilation from Prof. Babington and Messrs. Baker, Boulger, and Townsend.

Mr. Newbould was born at Sheffield on the 20th of January, 1819, his father being a merchant engaged in trade with Russia. He acquired his taste for botany at a preparatory school near Doncaster, which was kept by the father of a living Yorkshire botanist, Peter Inchbald, Esq., now residing at Fulwith Grange, near Harrogate; and later on attended some of the lectures of John Bohler. He then went to Cambridge, where he entered at Trinity College, and attended with great interest the lectures of Prof. Henslow. He was introduced by Henslow to Mr. C. C. Babington, the constant friend of his after-life, who was ten years his senior. Those were the days of the early editions of the 'Manual,' and under Babington's influence his love for botany was much strengthened and his knowledge of plants greatly increased. He was one of the most active helpers in working out the Flora of Cambridgeshire; his assistance in this work (which appeared in 1860) is thus acknowledged by Mr. Babington: "Mr. Newbould has given me the greatest possible assistance by the communication of notes and specimens; indeed without his help I could not have now ventured to offer this book to botanists. The appearance of his initial upon nearly every page will show the great extent and value of his contributions" (Preface, p. iv.). This acknowledgment, corresponding as it does with others which will be quoted later on, characterises the kind of help which Mr. Newbould, to the end of his life, was always ready to afford, and which none could furnish more efficiently than he. Of late years, indeed, he worked more with books and less with plants; but his willingness to be of service was always the same.

During his residence at Cambridge he manifested his interest in botany in other ways. He was one of the early Fellows of the

Botanical Society of Edinburgh, having been elected on June 10th, 1841, and was one of the original Members of the Ray Society, in 1844. In 1842 he visited Jersey; and in 1848 he accompanied Prof. Babington, visiting Pembrokeshire and other parts of Wales, on one of those excursions in which he so much delighted, and a list of the plants observed by them was drawn up for Mr. Watson:* on this occasion they collected *Fumaria confusa*,† which formed the subject of a paper by Babington in 'Bot. Gazette,' i. 61–64. He added to the British Flora, in 1846, *Ranunculus Drouetii*‡; in 1847, *Sagina ciliata*§ and *Apera interrupta*,‖ both found by him at Thetford; in 1848, *Melilotus arvensis*¶ at Thetford and *Orobanche Picridis*** at Comberton, about five miles west of Cambridge, where he was then curate-in-charge, and whence, in 1856, he sent the specimens of *Ranunculus Drouetii* figured in 'Eng. Bot. Suppl.' t. 2967. Mr. Gibson, who was materially assisted by Mr. Newbould at a later period in his 'Flora of Essex,' fearing that a notice of *Melilotus arvensis* ('Phytologist,' iii. 481) might have been misunderstood, as attributing its discovery to him, wrote to disclaim the honour, heading his communication, "Mr. Newbould the discoverer of *Melilotus arvensis*," and crediting the first finding to "one of our most accurate yet diffident of botanists" —no inapt phrase for describing the man up to the day of his death, although penned nearly forty years ago. A letter written to Mr. Boulger in 1885, acknowledging a copy of the reprint of his biography of Mr. Gibson published in this Journal, touches on this point, and is characteristic as showing the accuracy, conscientiousness, modesty, and pertinacity which were such noticeable features in Mr. Newbould:—"I value very much what you have so kindly sent me. The picture of Mr. Gibson is excellent, and the life excellently written; but you do not give the year (1883?) in which he died, and do not give him the credit of discovering *Melilotus arvensis* in Essex. Notwithstanding Mr. Gibson's paper in the 'Phytologist' about that plant, Babington was its real discoverer as a British plant. He was the first to know its name and all about it. I was only the first person to pick it up. Babington, Borrer, Gibson, and myself were the party who went to Thetford when it was first noticed in England. In Essex both Gibson and Pryor considered it to be more wild than any other *Melilotus*, whatever may be the case in other counties." His name appears on the title-page as one of the authors of the last volume of the 'Supplement' to 'English Botany'; but this responsibility he always disclaimed, nor are his initials affixed to any of the descriptions.

Previous to this, however, and shortly after leaving Cambridge, where he took his B.A. in 1842, Mr. Newbould was curate of Bluntisham, in Huntingdonshire, having been ordained a deacon of the Established Church in 1844, and priest in 1845. He sub-

---

* 'Bot. Gazette,' i. 57 (1849).
† *l. c.* 63, where the plant is styled *F. agraria*. ‡ 'Fl. Cambridgeshire,' 3.
§ 'Ann. Mag. Nat. Hist.' 2nd S. i. 152. ‖ 'Engl. Bot. Suppl.' 2951.
¶ 'Phytologist,' iii. 540. ** 'Engl. Bot. Suppl.' 2956.

sequently removed to Comberton, where he married Miss Fendall, a niece of the rector, the Rev. James Fendall, after which event he resided for some time at the adjoining village of Toft, there being no house suitable at Comberton. While here he made the acquaintance of Mr. W. Mathews, now of Birmingham, but then at St. John's College.

While at Bluntisham he was not idle, as is shown by the catalogue of Huntingdonshire plants which he drew up for Mr. Watson, who says in 'Topographical Botany,' *apropos* of this and a less complete list for Bedfordshire, checked at a later date, "31. London Catalogue, edition third, checked for plants seen in the county of Huntingdon; the parts examined being chiefly Somersham, Soke, Holme Fen, and the neighbourhood of Gamlingay. 30. Mr. Newbould also kindly checked the Bedfordshire Monocotyledons in a London Catalogue, for use in the second part of this work. His list, as not all professing completeness, is quoted along with various manuscript notes, in the form of 'Newbould MS.'" ('Top. Bot.' ed. i. 530). He also contributed catalogues marked for Surrey, Middlesex, Cambridge, and S.W. Yorkshire.

It was during his residence at Bluntisham that he made the acquaintance of Mr. Frederick Townsend—another friend who entertained for him to the last a warm and sincere affection. Mr. Townsend has kindly sent me some notes, from which I take the following particulars:—"My acquaintance with Mr. Newbould dates from about 1846, when I first met him at Madingley on the occasion of one of Prof. Henslow's botanical excursions at that place. We immediately fraternised, and he asked me to come and stay with him. I accepted his invitation, and, when the term ended, went to Bluntisham. On this occasion I remember being struck with his intense earnestness in conversation on subjects which more especially interested him, such as botany, poetry, and metaphysics, and the study of the latter as based on phrenology which had great attractions for him. The great phrenologist Spurzheim had nursed him, as a boy, on his knee. His mind was remarkably open to impressions; he was a ready listener; during our meals he would sit so completely absorbed in conversation that he forgot to eat, and I had repeatedly to remind him that his plate was untouched; ultimately I found the only way to get him to take his food was to be silent until his plate was cleared." Those who knew Mr. Newbould will recognise that this picture was equally accurate in later years.

It was probably about this time that he became acquainted with Mr. Watson, for whom he always entertained the greatest veneration. Mr. Newbould contributed specimens to the Botanical Society of London, of which Mr. Watson was at this time the mainstay; and their friendship may have been established through this circumstance. The tribute in 'Topographical Botany' to Mr. Newbould's general helpfulness may be quoted here:—"In various modes I have been assisted by Mr. Newbould, while writing this and former works. Indeed that gentleman's ever readinees to take trouble on behalf of other botanists is too well known to need eulogy from my

pen; though it may be allowable here to record an expression of my own grateful sense of his indefatigable and disinterested zeal in the promotion of botanical knowledge" ('Top. Bot.' 530). In 1883, two years after Mr. Watson's death, a second edition of this work was published under the superintendence of Mr. Baker and Mr. Newbould, whose names, although absent from the title-page, are signed to the short introduction which prefaces the volume.

Until Mr. Watson's failing health rendered visits trying to him, Mr. Newbould was accustomed to take any young botanists whom he considered of promise to see him at Thames Ditton; and the kind reception they met with somewhat surprised those who had previously known him only through his writings. In January, 1881, an absurd rumour as to the authorship of 'English Botany,' ed. 3, was the occasion of a letter from Mr. Watson to Mr. Newbould, which, with a characteristic reply, will be found in this Journal for 1881, p. 89. He did not say much about it, but he was manifestly pained by the somewhat harsh tone of the letter, which, with its answer, he circulated widely among British botanists. He sent a copy to Dr. Boswell, who, Mr. Watson thought, might have been injured by the rumour; but this was not acknowledged, to Mr. Newbould's great regret. Mr. Boulger writes:—"Mr. Newbould used to say that he believed he might take credit to himself for having to some extent brought Mr. Syme and 'English Botany' together, since, knowing that Mr. Syme was meditating some independent work on British Botany and that the proprietors of 'English Botany' were intending to issue a new edition of that work, which might have fallen into less thoroughly scientific hands, he persuaded Mr. Syme to undertake the work and the publishers to entrust it to him." He was one of those who stood round Mr. Watson's grave at Thames Ditton on a summer afternoon of the same year, with some who were, not many years later, to stand round his own.

Prof. Babington gives me the following note of an early excursion:—"On my return from Iceland in 1845, I met him in Edinburgh, and we went together to Loch Tay, and afterwards to spend a few days with Rev. Jos. Goodsir, the minister of Largo, in Fifeshire. On going from there to Edinburgh we were upset off a coach, and his shoulder was put out. I found a doctor at once (thank God) and got it put in, and we returned to Largo, where Prof. Goodsir was visiting his brotlier, and took charge of W. W. N., keeping him there for several weeks. Then we returned to England by sea." When Babington was preparing his 'Revision of the Flora of Iceland,' read at the Linnean Society in 1870, Mr. Newbould identified Solander's Iceland plants in the British Museum Herbarium, and the names attached to these are in his handwriting.

In 1852 Mr. Newbould was at the meeting of the British Association in Belfast, after which, in company with Mr. Babington, he visited the Giant's Causeway, &c. A reference to their visit will be found in Babington's description of *Agrimonia odorata* in 'Eng. Bot. Suppl.' t. 2983. This plant had first been recognised as British—if the Channel Islands can be said to come under that designation—by Mr. Newbould, who gathered it in Jersey in 1842,

and it was now collected by the two botanists "on the shore of Lough Neagh, by Shanes Castle," Co. Antrim, on Sept. 9th, 1852. His specimens, with this locality and date, are in the Herbarium of the British Museum, where a large number of plants collected by Mr. Newbould are to be found. When Messrs. Trimen and Dyer were engaged on the 'Flora of Middlesex,' Mr. Newbould was intimately associated with them, and divided his herbarium among them, Dr. Trimen's portion being subsequently transferred, with the rest of his plants, to the British Museum. In 1858 Messrs. Babington and Newbould paid a second visit to Ireland,—this time to the south of the country,—and nearly ran on the Saltees in crossing from Milford Haven to Waterford.

In 1860 Mr. Newbould, who was then living at Turnham Green, visited the Department of Botany at the British Museum, where he soon made himself at home. His chief attraction here was the Herbarium of Adam Buddle, preserved in the Sloane Collection, which was long his ideal of what a herbarium ought to be, and the MS. Catalogue of which (Sloane MSS. 2970–72) he transcribed no less than four times. For some years the greater part of Mr. Newbould's time was spent in the Department of Botany, and to him in 1864 I was indebted for an introduction to Mr. J. J. Bennett, the then keeper, and to Mr. Carruthers, then the only assistant. The undermanned and unfrequented condition of the Department at that date was a remarkable contrast to its present state. Mr. Newbould's visits to the Department were terminated through a misunderstanding for which he alone was responsible. In 1863 Mr. Syme (now Dr. Boswell) had begun the issue of the third edition of 'English Botany,' in the preface to which he states that "his thanks are especially due to the Rev. W. W. Newbould, who has assisted him not only with the loan of many valuable books which could not otherwise have been consulted, but also with the results of his long and extensive study of critical plants and synonyms." In the first number was published the plant now united by many botanists with *Ranunculus penicillatus* under the name of "*R. peltatus* Fries, ? var. *γ. pseudo-fluitans*, to which was added as a synonym "*R. pseudo-fluitans* Newbould MS."; Mr. Syme adds, "The variety *γ.* is a very remarkable plant, and may be a distinct subspecies, as the Rev. W. W. Newbould inclines to think." The plant appeared as *R. pseudo-fluitans* Newb. in the 7th edition of Babington's 'Manual' (1867); and Mr. Carruthers cited it under this name in a notice of the 'Manual' in 'Journ. Bot.' 1867, 184. Mr. Newbould stoutly disclaimed any responsibility for the species, and wished Mr. Carruthers to suppress his name as the authority for it, which the latter, quoting as he did the species from the 'Manual,' was of course unable to do. This was unfortunately construed by Mr. Newbould as implying doubt of his veracity, and he withdrew from the Department of Botany for many years. The breach, however, was at length happily healed, and Mr. Newbould felt himself able to resume his studies in the Department of Botany, where he always seemed more at home than anywhere else, except in the Reading-room of the Museum.

Mr. G. S. Gibson's 'Flora of Essex' appeared in 1862: and for some time previous to this Mr. Newbould had been working at the botany of the county, with a view to helping in the work. Mr. Gibson, in his preface, says:—"I cannot omit to refer more particularly to my valued friend W. W. Newbould, to whom I feel very greatly indebted for the assistance which he has most kindly and freely rendered. In addition to the time bestowed on ancient authorities and herbaria, he has undertaken excursions into several of the districts, for the purpose of noting localities; and, besides offering various important suggestions, he has revised the manuscript, assisted in correcting the proof sheets, while they were passing through the press, and added many critical notes. The accuracy of the work has been much enhanced by W. W. Newbould's exertions, but he is in no way committed to any remarks, excepting those to which his initial is appended." It is indeed from this work more than any other that the extent of Mr. Newbould's critical knowledge can be gathered; the notes signed "N." being often very suggestive, and showing that intimate acquaintance with the old English authors and herbaria, as well as with the modern continental authorities, which gave his remarks their especial value. For this volume he examined the Herbarium of Samuel Dale,—then at Chelsea Gardens, but now incorporated with the British Museum collections,—in which Essex plants are largely represented; and noted that his plants were "labelled with more care and critical accuracy than those in any ante-Linnean collection" he had then seen ('Fl. Essex,' p. 447).

In this year, too, he accompanied his friend Babington and the eminent French botanist Jacques Gay on an expedition into North Wales, which the latter had undertaken with a view of studying the *Isoetes* of that country, and of which he published a charming account in the tenth volume of the 'Bulletin de la Société Botanique de France.' The two English botanists joined the distinguished Frenchman at Bangor on the 12th of August, and M. Gay refers to Mr. Newbould as "un auxiliare très-utile dans l'exploration projetée, vu que c'est un homme des plus versés dans les détails spécifiques de la botanique anglaise, quoiqu'il n'ait rien écrit, que je sache, sur la matière, ni, je crois, travaillé à se former un herbier" (p. 320). Mr. Newbould always looked back upon this expedition, and his association with Gay, with peculiar pleasure.

In October of this year he was at the Cambridge Meeting of the British Association (of which body he was an Associate). In the "recommendation of the General Committee" it is noted "That Dr. [J. E.] Gray, Professor Babington, and Mr. Newbold [*sic*] be a Committee to report on the Plants of Ray's 'Synopsis Stirpium,' for the examination of the original Herbaria of Ray, Richardson, Buddle, Plukenet, and others" ('Report,' p. xlii). The Committee, on which Mr. Newbould never consented to act, never delivered the proposed Report.

On Jan. 11th, 1863, Mr. Newbould was elected a Fellow of the Linnean Society, the meetings of which, during the latter part of his life more especially, he frequently attended, and in the reading-

room of which he was constantly engaged in his favourite occupation of making extracts from old books for the help of country botanists who had no access to a large library. Here he transcribed for the authors of the 'Cybele Hibernica' a MS. of Patrick Browne's, entitled 'Fasciculus Plantarum Hiberniæ'; this help and further aid "in the revision of proof sheets and by consulting the works of the earlier English botanists, not accessible in Dublin," is acknowledged in the preface to the work, which appeared in 1866.

It was in 1864 that I made Mr. Newbould's acquaintance. He called on me in connection with a note on some introduced plants which had appeared at Kew Bridge, which I had published in this Journal for Dec., 1863 (p. 375), which number also contained the only independent communication bearing Mr. Newbould's name as anthor. This was a note of less than half a page, entitled "Is *Hutchinsia alpina* a British plant?": and I believe I am right in saying that, although it stands in Mr. Newbould's name, he did not actually write it. The anxiety to be kind and helpful to young botanists, which was one of his most characteristic traits, induced Mr. Newbould to seek me out at Chelsea, where I was then living; and from that time until the end of his life I constantly enjoyed his friendship. Those were the most flourishing days of the Society of Amateur Botanists, which then met at 192, Piccadilly, in a room over Mr. Hardwicke's shop. Under the presidency of Mr. M. C. Cooke, who was considerably the senior of most of the members, the younger London botanists gathered together fortnightly for the reading and discussion of papers, exhibition of specimens, and the like. Among them were many of those whose names are now familiar to botanists, such as Mr. Worthington G. Smith, Mr. W. T. T. Dyer, and Dr. Trimen; with others who have dropped out of active botanical work, such as Mr. A. B. Cole, Mr. James Collins, and Mr. James Irvine. Dr. Seemann occasionally paid us a visit, and Mr. Newbould was frequently at hand, not only at the meetings, but also at the summer excursions of the Society. I have a vivid recollection of a visit to New Cross, in the late summer of 1865 or 1866, when Mr. Newbould pointed out to me certain characteristics of *Alisma lanceolatum* With., *Chenopodium ficifolium*, and other plants. He was then, as always, a most interesting companion on an excursion, pointing out minute characters and means of distinguishing allied species not always to be found in books, and full of references to German and French authors, such as Koch, and Grenier & Godron. His familiarity with continental works and his frequent references to them in conversation was often somewhat bewildering to the novice who knew little beyond his Bentham or his Babington, especially as he did not always succeed in making plain to his listener what was obvious enough to himself. Mr. Baker writes:—"He did not take so much interest or know much about the great critical genera, such as *Rubus*, *Rosa*, *Salix*, and *Hieracium*, but such plants as the Batrachian Ranunculi, the buttercups of the *acris* set, the burdocks, the docks, the dimorphic-leaved pondweeds, and the avicularian Polygona, he was never tired of observing and expatiating upon

their delicate shades of difference. He used often to say that if he went an excursion on his own account he should most likely turn into the first field and stay there till night-time."

About this time Messrs. Trimen and Dyer began to prepare the 'Flora of Middlesex' (which was published in 1869), and Mr. Newbould at once threw himself into a work so greatly in accordance with his tastes. This Flora set the example of that full recognition of the researches of the older botanists which now seems naturally to form a part of similar undertakings; and both in book and field work Mr. Newbould was of great assistance. During its progress he left part of the MS., prepared for press, in a cab—an accident which greatly distressed him. The authors acknowledge "Very numerous localities, loan of books, critical suggestions, and much help in many ways," and also say, "The Rev. W. W. Newbould requires special mention, for his care in helping to correct the proof-sheets."

On my return to London from High Wycombe in 1869, I was able to resume the acquaintance with Mr. Newbould, which had been kept up only by correspondence during my residence in the country, and I soon experienced his help in compiling a list of 'Contributions to the Flora of Berkshire' for the Newbury District Field Club: the list he furnished me with was of plants noticed about Pangbourne and Streatley. He was at this time living in Albany Street, Regent's Park. On my removal from Kew to the British Museum, I used frequently to meet Mr. Newbould in the Reading-room; for at that time, as already noted, he did not feel able to visit the Department of Botany. The Berkshire list referred to brought me into communication with Mr. R. A. Pryor, and I had the pleasure of introducing him to Mr. Newbould. A warm attachment soon sprang up between the two botanists, who, in some respects widely dissimilar, had many points in common. Mr. Newbould took many excursions with Mr. Pryor, and was deeply interested in his intended Flora of Hertfordshire. On the death of the latter in 1881, I consented to see the work, still incomplete, through the press, Mr. Newbould having undertaken to transcribe the MS.; but the slow progress made not unreasonably failed to satisfy the Hertfordshire Natural History Society, who, in 1883, placed the work (which is still unpublished) in other hands. Mr. Newbould found in Mr. Pryor and in another close friend of his later life, Mr. G. S. Boulger, warm and practical supporters of the theory of plant-distribution in connection with river-basins, of which he was a staunch advocate. This was a point the importance of which he always felt Mr. Watson had failed to grasp; and showed that, deep as was his respect for the botanist of Thames Ditton, he could differ from his views when occasion arose.

The two independently published Floras in which Mr. Newbould took most active interest during the last decade of his life were those of Hampshire and West Yorkshire. He was also much pleased with Mr. Bagnall's 'Flora of Warwickshire,' published in the 'Midland Naturalist.' For the Hampshire Flora he undertook excursions into some of the districts of the county, in company with

its author, his old and valued friend, Mr. Townsend; and in the preface of the work (published in 1882) is the following acknowledgment of his assistance:—"I am especially indebted to the Rev. W. W. Newbould, more especially for reference to British Museum Herbarium localities, as well as to old authorities, in which he is known to be so well versed. Although I have myself endeavoured to work up the latter from original sources, yet my references would have been far less accurate and complete had it not been for his valued help."

Some years later, during a time when the family living of Honington, in Warwickshire, was vacant, Mr. Townsend persuaded Mr. Newbould, not without great difficulty, to undertake the duties until an incumbent should be found. Of his work at Honington, Mr. Townsend writes:—"He endeared himself to the parishioners, who greatly appreciated his kindness and earnestness. He was most reverent and impressive in reading and in the general exercise of his duties in the service of the Church, and his sermons were much liked. His delivery, though somewhat monotonous, was clear and distinct. His sermons were, I believe, mostly compiled from well-known sources. Keble was, I know, a favourite writer. He depreciated his individual teaching and influence in private, strong though was his faith. In the house of God he seemed to gain strength, and his faith stood him better in stead. His departure, when the living was presented, was regretted by the whole parish." Mr. Newbould spoke with much pleasure of his church work at Honington, and was especially delighted at being told by the poor that they could understand his sermons. He has often told me of the trouble he took to choose short words. During his residence at Kew, which began in 1879, he was a constant helper in the services both at Kew and Petersham.

The West Yorkshire Flora may literally be said to have been Mr. Newbould's last botanical interest. The first or introductory volume was published in 1878, and was dedicated by the authors, Messrs. J. W. Davis and F. A. Lees, to Messrs. Baker and Newbould—to the latter "as a means of connecting his name with a Riding and a work that alike owe much to his profound botanical research." In the preface, too, Mr. Newbould is mentioned as one "without whose most unselfishly rendered help the Flora could never have been written." The second volume of the book, containing the Flora itself, had been long delayed. Mr. Baker writes:—"During his last illness, after he had been confined to bed many days, and appeared to be rallying, a box came to me containing the manuscript of the long-expected Flora of West Yorkshire. When I went to pay him a call on Thursday morning he begged me to let him have some of the manuscript to look over. I went hastily home and brought him a small bundle, for which he thanked me, and I left him, little expecting that I should not see him alive again."

The last work on which Mr. Newbould was engaged before his illness was transcribing Surrey localities for Mr. Beeby from Mr. Watson's herbarium. He had also for some time been engaged

in going through the works of Turner, Gerard, Parkinson, How, Merrett, Ray, and others, and copying out under their respective counties the various localities given for British plants.

The appearance of a new edition of Babington's 'Manual,' and, in later years, of the 'Student's Flora,' was an event of the greatest interest to Mr. Newbould. He would go carefully through it, page by page, noting the changes, however slight, which had been introduced, and marking them in his copy. He was always fond of annotating books; and those who lent him such would find on their return many suggestive additions in his small and not too legible hand. At one time he always carried about with him a copy of Ray's 'Synopsis,' so that he might obtain in it the autograph of any botanist he happened to meet.

For many years, and especially since he took up his residence at Kew, his chief friends were Mr. and Mrs. Baker, who looked after his comfort in many ways up to the time of his death. Mr. Baker writes:—"I first made his personal acquaintance nearly thirty years ago at a dinner at Mr. Syme's, the other guests at which were Mr. Watson and Dr. Dickie. I had his company on excursions to Northumberland and Durham, North Yorkshire, Surrey, and Derbyshire, the botanical results of which have been published in the Journal or elsewhere; and he helped me most gladly in preparing for the press and correcting the proof-sheets of 'Topographical Botany,' ed. 2, though here again he strongly protested against his name being printed on the title-page. Last year he went down for me to Manchester to make a list on behalf of the Lake flora of the plants contained in a small herbarium collected in early life by the celebrated John Dalton, who was a native of Kendal." An account of the plants observed at Matlock in 1884 by Mr. Newbould and Mr. Baker was published in this Journal for November of that year, the names of both botanists standing as authors. When Mr. Newbould brought me the paper he had carefully erased his own name; and when I jokingly taxed him with tampering with the MS., he made a characteristic protest against being considered as part author. On the occasion of this visit to Matlock he made the acquaintance of the Rev. W. Moyle Rogers and Mr. J. E. Bagnall, of which he spoke with great pleasure. He took part in the 1884 meeting of the British Association at York, and was selected to carry the bishop's staff at the Sunday service in the Minster. After the meeting he joined Prof. Babington at Grange-over-Sands, and as usual much enjoyed botanical rambles in his company. His last excursion was one with Mr. Baker in the north of Surrey, to hunt up bramble stations for Mr. Beeby, the results of which are recorded in this Journal for Jan.–March last.

It would hardly be possible to name a living British botanist to whom Mr. Newbould had not in some way been helpful; and it seemed somewhat strange that so few assembled round his grave to show him the last signs of respect. He himself was careful to pay this little tribute to those whom he had known. He was

always glad to be introduced to a new observer; and his desire to be kind and encouraging, and to avoid anything like a disparaging remark, sometimes led to amusing circumlocutions. Thus, when asked his opinion of one whom he took for a botanical ramble, he said: "Well, you think at first that he doesn't see anything, but when you point it out to him you find that he *has* seen it all the time, though he hasn't said anything about it." On another occasion I asked him if some one—not a botanist—was not a lazy man: and he said, "Well, I would rather say that he had a good deal of slothful energy."

Although his devotion to botany may be said to have been Mr. Newbould's leading characteristic, his interest in general matters was very great, and his information singularly varied. He was a man of wide sympathies: himself a staunch Church of England man, and a reader of the 'Guardian,' and having that love for a reverent and moderate ritual which distinguished the earlier "High Church" party, he was able to appreciate the good work of those whose opinions he did not share. He had, too, a great appreciation of little kindnesses, of which he was himself most lavish. He has more than once told me Cardinal Manning, then Archdeacon of Chichester, patted him on the shoulder when a lad and said some kind word, of which the memory was always pleasant to him. The affection and esteem in which he was held by those inferior to him in social position may be in fact accounted for by his extreme thoughtfulness for them. Mr. W. Moss, now of the Workmen's Club, Oatlands, Surrey, has very kindly forwarded me his reminiscences of Mr. Newbould, from which I extract some characteristic passages:—"My remembrance of the late Rev. W. W. Newbould dates back to the year 1866, when he was on a long visit to my employer, Frederick Townsend, Esq., who then resided at Shedfield Lodge, near Wickham, Hants, and was at that time rearranging his large collection of botanic specimens, in which he was very largely assisted by Mr. Newbould, who used often to come and chat with me while I was at my daily work in the gardens and on the lawns. It was always his custom to come down to my house on Sunday evenings, and, as he used to say, be a boy again in the midst of the twenty or thirty lads who formed my Sunday evening class; and he used to be delighted to see Mrs. Townsend safe down to the class on the dark nights in winter, and, as he used laughingly to say, to carry her books and music and be her light-bearer. We could never get him to take part in our little Sunday evening service with the lads; his answer always was, 'Do let me be a happy boy again, and listen and sing with your other boys.' Many a time he has come and shook my hand, and said, 'You don't know how I have enjoyed your talk to-night'; and I shall never forget how, on one dark November night, St. Andrew's Day fell on the Sunday. I had been telling my boys a story illustrating St. Andrew's life; I saw the tears stream down his face, and he said, 'I think your story was intended for me; thank you heartily for it.' We all learned to dearly love him; he was so simple, and yet so earnest and so good. I had a collecting-

box in my front room for the Cottage Hospital, and I used regularly to find a half-sovereign in it that I could not account for, as none of my friends had such coins to spare. At last it struck me who the giver was, and the next time the box was emptied I determined to find out if I was right. In a Sunday or two our dear old friend came down with Mrs. Townsend, and put her cloak and his hat on the table on which my box stood; and on their leaving he was very busy getting the cloak and hat; so as soon as he had gone I looked in the box, of which I had the key, and sure enough there was the golden visitor. Truly he was one of those that did not let his left hand know what his right hand did. Time and space would fail me to tell all the little acts of kindness that he was constantly doing." Mr. Moss adds:—"His sermons were short, simple, and earnest; the preacher was forgotten in the simple gospel message he had to give. The old people used to call him 'our old gentleman,' and I know that many of them greatly valued his earnest simple ministry." A hearer in a different rank of life was equally favourably impressed with Mr. Newbould's capability as a preacher. Mr. J. J. Bennett, in 1863 (when Prof. Babington and Mr. Newbould were again in Wales), wrote to Mr. Carruthers from Llanberis, where Mr. Newbould had been preaching:—"His sermon was an excellent one, and, but for a little of his usual nervousness of manner, excellently well preached. It was on the text, 'How shall we escape, if we neglect so great salvation?' and was a thoroughly clever, well-arranged, and lucid exposition of the passage. A little more energy of manner would have made it all that could be desired; but it was obvious that the deficiency in this respect was greatly due to want of recent practice, and that he is really very much at home in the pulpit."

It is not always easy to draw a verbal picture of one whom we have known; and it is thus a satisfaction to me to be able to give a portrait of Mr. Newbould, from a photograph taken about ten years since. The following sketch from one who knew and loved him may help to supply details which the portrait, although a good one, does not suggest:—"No one who has been at all a frequent *habitué* of the Reading-room of the British Museum can easily help missing—no one can speedily forget—that slight, bent figure, frail to attenuation with hardness of study and poverty of living; the bald head, its scanty fringe of hair grizzled like the beard which all but hid the nervous, sensitive mouth; the wide, benevolent forehead; the ragged, penthouse brows, shading eyes sometimes almost uncanny in their weird brightness, sometimes beaming with simple, child-like pleasure,—the pleasure perhaps of knowing that he had in his pocket some rare volume picked up at a second-hand book-stall for the friend to whom he was talking,—sometimes pathetic with an almost wistful appeal for sympathy and indulgence with one who never failed to give of both to all who came in contact with him; the long, lean, nervous hands, pointed at the tips for handling of minute specimens, dusky with dust of rarely-opened books; the thin, aquiline nose, bowed shoulders, and quick yet shuffling step; the rusty tie, worn

felt hat, and shabby, ill-cut clothes, powdered with dirt of museums, shiny with friction of desks, piteous often in their lack of a woman's hand to keep them neat or mended, their palpable insufficiency to meet the severities of wind and weather to which he was so constantly exposed; yet never, through all their dinginess and poverty, lacking that impalpable something, that unconscious, indestructible stamp of refinement, of gentle birth and gentle culture, which was one of the most delicately-marked characteristics of the man, whose absolute humility, whose absence of every vestige of pretension, was his most striking virtue. . . . . We, workers in the world where he worked for others always, for himself never, forget many things and forget them easily; but those of us who have grown familiar with the picture thus recalled, who look for it in vain in the place where we have so long known it, will scarcely do so without a sigh, without a loving reverent remembrance of William Newbould."

Social work of any kind, aiming at the improvement of the condition of the poor, always had his sympathy; and he believed that the general tone and condition of what are often called "the working classes" had been materially raised during the last twenty or thirty years. He was a total abstainer, and almost a vegetarian; he was also, without in any way lessening his attachment to the Established Church, much interested in spiritualism, and a believer in the supernatural origin of the phenomena connected with it. He was frequently to be seen at "first night" performances, and had (especially when he knew the lecturers personally) a great fondness for lectures. His criticisms on these were very shrewd and suggestive. Mr. Townsend writes:—"It may be a matter of surprise to some that Mr. Newbould never rose above the position of curate, but I know that he refused at least one living, and this from purely conscientious motives. This conscientiousness was one of the marked and strongest features in his character, so much so as to become almost morbid. This prevented him from undertaking anything on his own responsibility; he was a strong support to others, but he hesitated to act where he would have to take the most prominent part, or would have to rest on his own judgment."

The illness which terminated fatally in the early morning of Friday, the 16th of April, originated in a severe cold. In the early winter he was knocked down by a cab in the streets of London. No bones were broken, and it did not evidently seem to injure him much then, but the accident gave a shock to his system. He caught cold at the time, and in the severe weather of March this became worse, and turned to acute pneumonia. The inflammation was subdued, and he seemed to be gradually gaining strength; but symptoms of weak action of the heart appeared, and on Thursday, the 15th of April, he grew rapidly worse, and died the following morning.

His name is commemorated in Botany by the beautiful Bignoniaceous genus *Newbouldia*, which Dr. Seemann named after him (as "one of the most painstaking of British botanists") in the first volume of this Journal (1863, p. 225).

Those who form their estimate of a man's influence and ability from the number and magnitude of the works standing in his name will hardly recognise Mr. Newbould's right to a place in their consideration. Even before those who cherish his memory have passed away, his now familiar name will cease to be quoted in our books: and this consideration, among others, has urged me to write this detailed sketch of his life. But it may be doubted if there has ever been, and it is hardly likely that there will be again, a man so forgetful of self and so ready to help others, so eager to advance the interests of his friends and so careless of his own, so kind and considerate to his inferiors, whether in position or in attainments, and so deeply and sincerely regretted by every student of British botany, as William Williamson Newbould.

JAMES BRITTEN.

ANGOLAN *SELAGINEÆ*.

BY R. A. ROLFE, A.L.S.

THREE species of this small order were collected by the late Dr Welwitsch in Angola, two of which have been met with by subsequent collectors in that region. All three are new to science, and I therefore propose to describe them in the following paper. Their occurrence is somewhat interesting from a geographical point of view. Excluding the suborder *Globularieæ* and the northern genus *Lagotis*, the remainder of the order is almost concentrated in extra-tropical South Africa, the exceptions being a single species of *Dischisma*, identical with a Cape species, in Australia, a few species of the two undermentioned genera which occur north of the Tropic of Capricorn, in Africa, and a single endemic species of *Selago* in Madagascar. Angola seems to form the northern limit of these genera on the western side of the Continent, and it is interesting to note that the species are distinct from those found elsewhere. On the eastern side *Hebenstreitia dentata* L. is found on Mt. Kilimanjaro and the mountains of Abyssinia, as well as at the Cape; while *Selago* is represented by *S. lacunosa* Kl. in Mozambique, by two peculiar species on Mt. Kilimanjaro, and by one or two others, as yet undescribed, from other localities.

Hebenstreitia angolensis, n. sp. — A branching perennial herb, 2 ft. or more high, with erect leafy minutely puberulous branches; the minute retrorse hairs generally in decurrent lines from the leaf-bases. Leaves usually somewhat fascicled, narrowly linear, subobtuse, entire, glabrous, 1–3½ in. long, ½–1½ lin. wide. Spikes slender, 4–6 in. long, with numerous flowers. Bracts concave, ovate, obtuse or emarginate, often ending in a distinct apiculus, glabrous, 1½ lin. long. Calyx spathaceous, concave, ovate, subacute, submembranaceous with 2 or sometimes 3 nerves, 1 lin. long. Corolla ½ in. long, 1-lipped, split down for nearly two-thirds of its length; lip subequally 4-lobed, the outer lobes broader

than the inner ones, none of them exceeding ½ lin. long. Stamens and pistil as in genus. Fruit oblong, 2 lin. long.

Hab. In Angola, *Welwitsch*, n. 4786, "freq. in paucis locis juxta Rivum de Humpata, corolla albida disco labio macula longa lataque intense aurantiaca vel imo coccineo picta, April 1860"; also n. 4787, "In dumetis ad rivulos sed rarius, Jan. 1860."

Allied to *H. integrifolia* L. and *H. dentata* L., but with longer leaves than either of them. It is further distinguished from the latter by its entire leaves. All the species of this group are closely allied, and difficult to distinguish by satisfactory characters.

Selago alopecuroides, n. sp.—A perennial herb, 1–2 ft. high, with numerous puberulous or pubescent erect simple leafy branches from a decumbent branching base. Leaves fascicled, very narrowly linear, obtuse, glabrous, 4–6 lines long. Panicles spike-like, subcylindrical, narrow, 2–4 in. long, with numerous minute flowers on very short congested lateral branchlets. Bracts very narrowly linear, obtuse, glabrous or ciliate near the base, ¾ lin. long, a little adnate to calyx at extreme base. Calyx tripartite, ½ lin. long, its lobes linear-oblong, obtuse, ciliate, the superior lobe a little shorter than the lateral ones. Corolla-tube ½ lin. long, lobes obovate-oblong, those of the lower lip equalling the tube, of upper lip a little shorter. Stamens and pistil as in genus. Fruit not seen.

Hab. In Angola, *Welwitsch*, n. 4789, "In dumis petrosis prope Lopolo, floribus albido-violaceis, Dec. 1859"; also n. 4790, in same locality, "Floribus violaceis, Jan. 1860"; Chella Mountains, *H. H. Johnston*, Sept. 1883. All in the Huilla district.

A most distinct species, allied to *S. lacunosa* Kl. of Mozambique, though differing in habit. The latter, together with the narrow cylindrical spike-like panicles, reminds one of certain species of *Reseda*.

Selago Welwitschii, n. sp.—A much-branched perennial herb, 1–2 ft. high, with puberulous branches from a decumbent or prostrate woody bass. Leaves usually somewhat fascicled, linear or narrowing a little towards base, obtuse, puberulous, 3–7 lin. long, ¾–1 lin. wide. Spikes numerous, short or subcapitate when young, on short lateral branchlets towards the summit of the branches. Bracts linear or linear-oblong, obtuse, puberulous, 1–1½ lin. long. Calyx deeply 5-fid, pubescent, ¾ lin. long, its lobes linear, obtuse, and ciliate. Corolla-tube slender, 1–1½ lin. long, lobes oblong or roundish-oblong, those of the lower lip one-third as long as the tube, of upper lip still shorter. Stamens and pistil as in genus. Fruit subcompressed, globose, ¾ lin diam.

Hab. In Angola, in the Huilla district, *Welwitsch*, n. 4788, "Ubiquitaria in dumetosis collinis circo Lopolo, floribus læte violaceis, Jan. 1860." Okahandya, Damara-land, *Dr. E. Höpfner*, n. 42, May 1882.

A marked species, not very nearly allied to anything as yet described.

ON THE FLORA OF THE UPPER TAMAR AND NEIGHBOURING DISTRICTS.

By the Rev. W. Moyle Rogers, F.L.S.

(Concluded from p. 148).

Salix fragilis L. I. Bude (Hind).—*S. alba* L. I. Bude (Hind). Marhamchurch. II. By canal, Bridgerule. — c. *vitellina*. I. Poughill (Hind). III. Southlands Plantation. — *S. triandra* L. III. Bridge Moor, one tree. — *S. viminalis* L. I. Marhamchurch. II. Whitstone. III. Near Bridgerule Church.—*S. Smithiana* Willd. (aggregate). I. Marhamchurch.— *S. rugosa* Leefe. I. Launcells. — *S. acuminata* Sm. I. Poughill (Hind). — *S. cinerea* L. — *S. aurita* L. — *S. caprea* L. — "*S. laurina*, *β. temuifolia?* L. Week St. Mary," I. (Hind). — *S. ambigua* Ehrh. I. "Heath between Yealm Bridge and Whitstone, with its two parents, *aurita* and *repens*" (Baker). I believe that I have also seen this occasionally on the Devon side of the Tamar. — *S. repens* L. At least two or three forms, common. The foregoing is a wholly inadequate account of the distribution of *Salix* species, as I have no critical knowledge of the genus.

Typha latifolia L. I. and II. By canal, in several places.

Sparganium ramosum L. — *S. simplex* Huds. Uncommon. II. and III. Reservoir. By canal, Bridgerule. IV. Stream below Sutcombe.

Arum maculatum L. I have not many localities on record for this, but it is no doubt quite common.

Lemna minor L.

Potamogeton natans L. II. Canal (Hind), at Bridgerule. III. Bridgerule :—pools in Tatson Lane and Hoskin's Moor Plantation. Dux Common. IV. Near Okehampton. — *P. polygonifolius* Pour. —*P. crispus* L. II. and III. Canal and river, and Bridgerule mill-stream, in great quantity, 1882. — *P. pusillus* L. With the last.

Zostera marina L. I. Bude (Hind).

Triglochin palustre L. I. Northcot Mouth. Bude (Hind!), beach and salt-marsh, with *T. maritimum* L.

Alisma Plantago L. Only moderately common.

Orchis mascula L. Rare or uncommon, so far as I have been able to observe. — *O. latifolia* L. Aggregate, *i. e.*, including *incarnata*, to which (in its wider application) the plants which I have examined seem chiefly, if not wholly to belong. The flesh-coloured form of *incarnata* has not yet been found, I believe, in Devon or E. Cornwall. — *O. maculata* L.

Habenaria viridis Brown. IV. Moorland pasture near Ashbury, in good quantity, 1885. — *H. bifolia* Bab. Man. Locally most abundant. I. Greena Moor. Jacobstow. Boscastle, marshy slope near sea. March near Tresparrot. III. Bridge Moor, 1882. Church Meadow, Bridgerule. Tinney Moor. Moors about Dunsland Cross. IV. Moors about Bradworthy, Sutcombe, north of Holsworthy, Beaworthy, and Ashbury. — *H. chlorantha* Bab. I.

Minster and Boscastle Valleys, abundant. [III. Between Parnacott and Holsworthy, in bushy ground, a plant or two. Most probably *chlorantha*, but the flowers were withered].

Spiranthes autumnalis Rich. Uncommon. I. High carboniferous cliffs south of Bude (Baker). Field near Hoppicott Down, several. Cliff by Wanson Mouth, one plant (1883). Downs above Lower Sharpnose Point (Webb). Near Tintagel (Keys' Fl. Dev. & Cornw.). III. Pancrasweek, on heath south of Stratton and Holsworthy Road. Near Hollaton. IV. Ugworthy Moor.

Listera ovata Brown. Uncommon. I. Thicket between Knowle and Burrow. III. Bridgerule, Vicarage and Southlands Plantations. IV. Moor between Beaworthy and Ashbury (one plant, 1885).

Epipactys latifolia Auct. II. By canal at Bridgerule. Whitstone, Plantation, and roadside near Rectory. III. Bridgerule and about Parnacott, in plenty. N. Tamerton. Dunsland Cross. Bridestow (Keys' Fl. Dev. and Cornw.). IV. Beaworthy. — *E. palustris* Crantz. III. Bridgerule Bog, in fair quantity.

Iris fœtidissima L. Rare. I. Near Launcells. Knowle. Langford Hill Plantation. II. Ditches between Red Post and Whitstone (Baker). — *I. Pseudacorus* L. (b. *acoriformis* the only form observed).

Narcissus Pseudo-Narcissus L. Denizen. I. Hedge-banks near Kilkhampton (Mrs. Kennedy). About Knowle. Hedges between Burrow and Burrow Cross. II. Northern end of Burn Plantation, by canal. About Newacott. III. In several places (plantations, orchards, &c.).

Galanthus nivalis L. Alien. I. Kilkhampton (Mrs. Kennedy). Knowle. II. Newacott. III. Tatson Orchard and Bridgerule Vicarage Plantation, in great quantity. Tetcott Rectory Orchard.

Tamus communis L.

Polygonatum multiflorum All. I. Hedge-banks, Kilkhampton (Mrs. Kennedy). Langford Hill Plantation, in great quantity. III. Bridgerule Vicarage Plantation; planted fifteen or twenty years ago, and still only two or three plants.

Convallaria majalis L. Alien. I. Boscastle (Hind).

Ruscus aculeatus L. Denizen. III. Tetcott, near farmyard.

Ornithogalum umbellatum L. Alien. II. Newacott.

Scilla autumnalis L. I. Tintagel (Keys' Fl. Dev. and Cornw., 1861; and Webb, 1885). This will surely be found elsewhere on this coast. I have seen it at Mortchoe, near Ilfracombe.—*S. verna* Huds. I. Exceedingly abundant from Sandymouth to Trebarwith. —*S. nutans* Sm.

Allium sibiricum L. I. "Tintagel, below the church" (Keys' Fl. Dev. and Cornw.). — *A. ursinum* L. Rather uncommon. I. Kilkhampton (Mrs. Kennedy). Bude. Stratton. Marhamchurch. Week St. Mary. III. By the river at N. Tamerton.

Narthecium ossifragum Huds. Remarkably common.

Luzula pilosa Willd. Uncommon. I. Kilkhampton (Mrs. Kennedy!), Combe Valley. Poughill (Hind). Near Stratton, in plenty. Roadside, north of Knowle. Tackbeare Lane. Minster Valley. III. Tetcott. — I have searched in vain for *Forsteri*. — *L. sylvatica*

Rich. Local. I. About Stratton, in plenty; as also at St. Knighton's Kieve and in Minster Valley. IV. About Okehampton.— *L. campestris* DC.— *L. multiflora* Koch. Type and *congesta* exceedingly common.

Juncus maritimus Sm. I. Bude (Hind!), on Summerleaze Down. — *J. conglomeratus* L. — *J. effusus* L. — *J. glaucus* Sibth. Locally abundant. I. Kilkhampton. Bude. Widmouth. II. and III. Bridgerule. Tetcott. — *J. acutiflorus* Ehrh. — *J. lamprocarpus* Ehrh. (Dr. Hind adds *nigritellus*, but without locality).— *J. supinus* Mœnch.— *J. bufonius* L.— *J. squarrosus* L. I. Kilkhampton (Mrs. Kennedy). IV. Near Sutcombe. Moorland near Ashbury.

Cladium Mariscus Brown. I. Morwinstow (Hind, 1873). I believe the only E. Cornwall locality known.

Scirpus palustris L. — *S. multicaulis* Sm. Rather common. I. Greena Moor. II. Between canal and Whitstone Road. III. Moor, Pancrasweek. Bridgerule Bog, 1882. Affaland Down. Moor, Dunsland Cross. IV. Near Sutcombe. Beaworthy. Ashbury. — *S. pauciflorus* Lightf. Very rare, as in S.W. England generally. I. Summerleaze Down, 1882.—*S. cæspitosus* L. Apparently rare. IV. Moors, Beaworthy and Ashbury, 1885. — *S. fluitans* L. Rather common. I. Greena Moor. III. Bridge Moor, 1882. By Reservoir. Near Hollaton. Near Dunsland Cross. IV. Near Okehampton.—*S. Savii* S. & M. I. Frequent. "Bude, &c." (Hind!). Summerleaze Down. Widmouth and Wanson Mouth, abundant. Tackbeare Lane, near farm-house, four or five miles from the sea. Boscastle and Tintagel. — *S. setaceus* L. I. Common along the coast, from Sandymouth to Boscastle and Minster Valley. Tackbeare. II. Bridgerule, by canal. III. Bridgerule and Tinney, common. IV. Sutcombe. Okehampton. —*S. Tabernæmontani* Gmel. I. River, &c., Bude (Baker!), in great quantity. (Dr. Hind, omitting this, gives "*S. lacustris* L. Bude, &c.," applying the name, I suppose, aggregately).—*S. maritimus* L. I. Bude Canal (Hind!). — *S. sylvaticus* L. III. By the Tamar.

Eriophorum angustifolium Roth.

Carex pulicaris L. — *C. arenaria* L. I. Bude (Hind!) and Widmouth. — *C. paniculata* L. Not very common. I. Simondsham. III. Bridgerule Bog. Swamp by Bridgerule and Holsworthy Road. —*C. vulpina* L. By coast from Sandymouth to Bude. Stratton. II. By canal, Bridgerule. — *C. muricata* L. I. Poughill (Hind). Stratton. Marhamchurch. Boscastle, in plenty on hill above Hotel, and in one spot near Forrabury Church. Minster Valley. Tintagel. Rare, or very local, in the other districts. III. N. Tamerton. — *C. stellulata* Good. — *C. remota* L.— *C. ovalis* Good.— *C. vulgaris* Fries.— *C. glauca* Scop.— *C. pilulifera* L. I. Common. II. Near Littlebridge. III. Near Worthen. Dux Common. IV. Okehampton.— *C. præcox* Jacq.— *C. panicea* L.— *C. pendula* Huds. I. Coombe Valley (Mrs. Kennedy). III. About Parnacott, but only where planted.—*C. sylvatica* Huds.—*C. lævigata* Sm. I. Kilkhampton (Mrs. Kennedy!). Boscastle and Minster Valleys. IV. Near Okehampton. — *C. binervis* Sm. — *C. distans* L. I. Bude, in plenty. — *C. fulva* Good. Remarkably common on the moors.—

C. extensa Good. I. Bude. — *C. flava* L. (probably including, as Mr. Briggs has implied, the "*C. Œderi* Ehrh. Morwinstow," of Dr. Hind's list). Very common, and all coming under the one form now considered to be *minor* (the *lepidocarpa* of Lon. Cat., Ed. 7). — *C. hirta* L. Rather uncommon. I. Sandymouth. Northcot Mouth. Bude. Titson. Week St. Mary. Minster Valley. III. Bridgerule, in two or three spots. — *C. riparia* Curtis. I. Canal at Bude. By stream, Marhamchurch. — *C. ampullacea* Good. I. By stream south of Greena Moor. III. Near Parnacott, ditch by Holsworthy Road. By Reservoir. IV. Near Bradworthy. — *C. vesicaria* L. II. and III. On both sides of the river from above Bridgerule to N. Tamerton, in immense quantity, 1882 (N. Devon).

Anthoxanthum odoratum L.

Digraphis arundinacea Trin.

Phalaris canariensis L. Alien. I. Bude, &c. (Hinds). III. Bridgerule, garden-weed.

Alopecurus geniculatus L. — *A. pratensis* L. Not observed in I. and II. III. Bridgerule. Clawton. Holsworthy. IV. Okehampton.

Phleum pratense L. (type and b. *nodosum*). — *P. arenarium* L. I. Bude (Hind!). Widmouth.

Gastridium lendigerum Gaud. I. Marhamchurch (Hind). Hillside east of Wanson Mouth, in considerable quantity; colonist.

Agrostis setacea Curtis. Locally common. I. Tresparrot Down. Lesnewth. III. Parnacott, 1885. IV. Sutcombe. Beaworthy and Ashbury, in plenty.— *A. canina* L.— *A. alba* L.— *A. vulgaris* With. —b. *pumila*. II. Near Reservoir. IV. Beaworthy.

Phragmites communis Trin. Rather rare. I. Near Bude and Widmouth. III. By Dunsland Cross.

Psamma arenaria R. & S. I. Bude (Hind!) and neighbourhood.

Milium effusum L. I. St. Knighton's Kieve (Tellam in Keys' 'Fl. Dev. and Cornw.'!). Not seen elsewhere.

Aira cæspitosa L. — *A. caryophyllea* L. — *A. præcox* L. Locally common. I. Widmouth. Boscastle and Tintagel. IV. Okehampton.

Avena flavescens L. Only locally common, I think. I. About Bude. III. Bridgerule, in plenty. IV. Okehampton.—*A. pubescens* L. I. Between Bude and Widmouth, for a short distance, 1882.— *A. strigosa* Schreb. Colonist. Rather frequent. I. Near Wanson Mouth (with *Gastridium*), in plenty. III. Bridgerule, in several fields and considerable quantity. Near Holsworthy. — *A. fatua* L. I. Poughill (Hind). Marhamchurch. II. Bridgerule. — *A. elatior* L.

Holcus mollis L. — *H. lanatus* L.

Triodia decumbens Beauv.

Kœleria cristata Pers. Rare. I. Valley of Rocks. Trebarwith.

Molinia cærulea, Mœnch.

Glyceria fluitans Brown. — b. *pedicillata*. III. Bridgerule in several places. — *G. plicata* Fries. In all the districts nearly as common as *fluitans*.

Sclerochloa maritima Lindl. I. Bude (Baker!).—*S. rigida* Link. I. Common. Not seen in the other districts. — *S. loliacea* Woods. I. Common by the sea.

Poa annua L. — *P. compressa* L. IV. Okehampton. — *P. pratensis* L. — *P. trivialis* L.

Briza media L. Local. I. Bude. Tackbeare. Greena Moor. Boscastle (Tellam in Keys' 'Fl. Dev. and Cornw.'!). III. Bridgerule.

Cynosurus cristatus L.

Dactylis glomerata L.

Festuca sciuroides Roth. I. Rather common. III. Bridgerule and Pyworthy, in a few spots only. Near Dunsland Cross Railway-station. IV. Near Ashbury. Okehampton. — *F. ovina* L. — *F. rubra* L. — *F. elatior* L. — *F. pratensis* Huds. I. Northcot Mouth. Boscastle (type and b. *loliacea*), in plenty. III. Bridgerule.

Bromus giganteus L. — *B. asper* Murr. Nowhere common, and on the Devon side of the river very rare. I. Occasionally between Stratton and Burrow. Tackbeare. II. Between Bridgerule Village and the canal. Whitstone. III. Ash Grove. — *B. sterilis* L. — *B. racemosus* "L." Fairly common (Dr. Hind, omitting this, gives, without locality, *commutatus*, which I have not met with). — *B. mollis* L.

Brachypodium sylvaticum R. & S.

Triticum repens L. — *T. acutum* DC. I. Bude (Baker!). — *T. junceum* L. I. Bude (Hind!). Northcot Mouth to Widmouth, frequent.

Lolium perenne L. — *L. italicum* Braun. (colonist). — *L. temulentum* L. I. Bude (Baker).—b. *arvense*. I. Kilkhampton (Hind). Field by Greena Moor (1883). III. Pyworthy, in field of wheat, in plenty (1885). Casual or colonist.

Lepturus filiformis Trin. I. Bude, beach and near breakwater.

Hordeum murinum L. Rare. I. Bude.

[*Trichomanes radicans* Swartz. Particulars of the circumstances under which this fern was seen at St. Knighton's Kieve, Distr. I. (1866–7) are given in Keys' 'Fl. Dev. and Cornw.' These were unknown to me at the time of my one hurried visit to the place (1882). There seems to be no record of its recent occurrence there.]

Adiantum Capillus-Veneris L. I. Boscastle (Hind).

Pteris aquilina L.

Lomaria Spicant Desv.

Asplenium Ruta-muraria L. — *A. Trichomanes* L. Rare. I. Minster Valley, and hill above Boscastle, in good quantity. Trebarwith. II. Werrington. III. Bridgerule, on bridge over a small stream, two or three plants. Tetcott, one plant (1883). — *A. marinum* L. I. Bude (Hind). Boscastle and Valley of Rocks, rather frequent, and extending nearly half a mile inland. Tintagel (Hind!), valley and rocks above the castle (with the two following species). Trebarwith. — *A. lanceolatum* Huds. I. Minster. Boscastle (Hind!), wall near Hotel, and rock-fissures. Valley of Rocks and Tintagel, very common. — *A. Adiantum-nigrum* L. I. and II. Rather common. III. Near Reservoir. Bridgerule, fairly frequent.

Clawton. IV. Okehampton. Scarce in much of the country between the Tamar and Dartmoor.

Athyrium Filix-fœmina Bernh.

Ceterach officinarum Willd. I. Walls of the bridge at Yealm Bridge (Baker).

Scolopendrium vulgare Sm.

Aspidium aculeatum Sw. Rare. III. Bridgerule:—hedge-bank near Furze, in several spots; [Vicarage Plantation, planted]. Hedge-bank near North Tamerton Bridge. — *A. angulare* Willd.

Nephrodium Filix-mas Rich. (type and c. *Borreri*). Very common. — b. *affine*. III. Bridgerule. — *N. spinulosum* Desv. I. Kilkhampton (Hind, who also gives "*glandulosum*. Poughill." I.). —*N. dilatatum* Desv. — *N. æmulum* Baker. Generally distributed, and rather common. — *N. Oreopteris* Desv. I. Week St. Mary. III. Bridgerule, Pyworthy, and Tinney; in several spots. Near Parnacott. IV. Between Soulden Cross and Reservoir. Sutcombe. Near Beaworthy.

Polypodium vulgare L. — [*P. Phegopteris* L. Found not many years ago near Parnacott, III.; but I searched the locality without success in 1885].—*P. Dryopteris* L. III. Wall, Bridgerule, two or three plants, escaped from former cultivation.

Osmunda regalis L. I. Minster and Boscastle Valleys, in great quantity. II. and III. Tamar Valley (Hind!), very common. Pancrasweek, roadside ditch. N. Tamerton.

Ophioglossum vulgatum L. IV. Beaworthy, between village and railway-station, in plenty. Moorland pasture near Ashbury Railway-station, in fair quantity.

Botrychium Lunaria Sw. IV. With the last, near Ashbury, a few plants.

Equisetum arvense L.—*E. maximum* Lam. I. Poughill (Hind).—*E. sylvaticum* L. I. Week St. Mary, damp wooded hollow east of village, May, 1885; fruiting, and in good quantity. I was directed to the locality by Rev. G. H. Hopkins, who discovered it some years ago. New record for Cornwall. Unknown in Devon.—*E. palustre* L.—Var. *nudum* DC. I. Bude (Hind).—*E. limosum* L. I. Lord's Meadow, Kilkhampton. Bude (Hind). II. and III. Canal in immense quantity.

Chara fragilis Desv. I. Bude (Hind). — *C. vulgaris* L. I. Poughill (Hind!).—Var. *melanopyrena*. II. Ditch near Littlebridge, in plenty. On this Messrs. H. & J. Groves remark ('Journ. Bot.,' Jan. 1884), "This form is distinguished by its nucules having a black nucleus, instead of brown, as in the type. Braun remarks that it is very rare."

Nitella flexilis Ag. II. Canal below Newacott. — *N. opaca* Ag. (? II. Canal below Newacott). III. Canal near the Reservoir. Stream south of Affaland Down.

NEW FERNS COLLECTED BY J. B. THURSTON, ESQ., IN FIJI.

By J. G. Baker, F.R.S.

In an expedition recently made by the Colonial Secretary of Fiji, J. B. Thurston, Esq., C.M.G., across the mountains of Viti Levu, the following new ferns were discovered. The numbers indicate their position in the sequence followed in our 'Synopsis Filicum.'

54.* **Cyathea Thurstoni,** n. sp.—Caudex 6–8 ft. long. Frond ample, rhomboid, tripinnate, 6–7 ft. long, moderately firm in texture, green on both surfaces, glabrous beneath, pilose only on the midrib of the pinnules above. Pinnæ oblong-lanceolate, 1–1½ ft. long, 7–8 in. broad; their rachises castaneous, naked; lower pinnæ reduced in size. Pinnules lanceolate, 3–4 in. long, ¾–⅞ in. broad, cut down to the midrib into numerous adnate linear-oblong entire or crenate tertiary segments 1-12th in. broad, with a distinct space between each of them. Veins 12–15-jugate, very distinct, deeply forked, the lowest sometimes with two branches: Sori crowded, costular, confined to the lower half of the segments, at most 10–12 to a segment. Indusia cup-shaped, moderately firm in texture, truncate at the throat, often turned over on the side, remaining entire or finally breaking up into two or three pieces.—Allied to *C. affinis* Swartz and *C. Milnei* Hook.

40.* **Alsophila dissitifolia,** n. sp. — Caudex short. Fronds ample, tripinnate, 4–5 ft. long, moderately firm in texture, green and glabrous on both surfaces, paleaceous on the midrib of the tertiary segments beneath. Pinnæ oblong-lanceolate, above a foot long, half a foot broad, their slender unarmed castaneous rachises slightly furfuraceous and minutely paleaceous. Pinnules lanceolate, pinnate, distinctly stalked, 3–3½ in. long, ¾–⅞ in. broad. Tertiary segments linear-oblong, dimorphic, the sterile ones broader and closer, the fertile ones narrower (1-12th in. broad), distinctly spaced out, deeply and uniformly crenate, the lowest with a short stalk. Veins simple, 7–8-jugate, distinct in the sterile segments, indistinct in the fertile ones. Sori costular, one to each lobe, reaching to the apex of the segments, often 14–16 to a segment.—Allied to *A. Hornei*, *truncata*, and *decurrens*.

146.* **Nephrodium** (Lastrea) **maximum,** n. sp. — Caudex short, erect. Stipe short. Frond ample, decompound, 7–8 ft. long, moderately firm in texture, green and glabrous on both surfaces, with a few paleæ on the ribs beneath. Pinnæ oblong-deltoid, above a foot long, half a foot broad. Pinnules deltoid, acuminate, cut away on the lower side at the base. Tertiary segments lanceolate-deltoid, unequal-sided sessile, cuneate truncate on the lower side at the base; ultimate lobes ascending, linear-oblong, obtuse. Veins forked or simple in the ultimate lobes. Sori costular, one at the base of each ultimate lobe. Indusium

large, glabrous, moderately persistent. — A large tree-fern-like *Lastrea*, allied to the Samoan *N. arborescens* Baker, with pinnæ like whole fronds of *N. sparsum*.

186.* **Nephrodium** (Eunephrodium) **decadens,** n. sp.—Stipe drab, finely pubescent, 3–4 in. long. Fronds oblong-lanceolate, 1½–2 ft. long, 4–5 in. broad, bipinnatifid, moderately firm in texture, green and finely pilose on both surfaces, narrowed very gradually from below the middle to the base. Pinnæ sessile, lanceolate, the largest 2–2½ in. long, under ½ in. broad, cut about half-way down to the rachis into close oblong entire lobes 1-12th in. broad. Veins simple, 5–6-jugate, only the lowest pair distinctly united apart from the sinus. Sori small, medial on the veins. Indusium minute, fugacious. — Intermediate between *N. Arbuscula* and *N. molle*. Nearly allied to the Philippine *N. hispidulum*.

128.* **Polypodium** (Eupolypodium) **stenopteron,** n. sp. — Stipe very short, densely clothed with spreading subulate hair-like brown paleæ. Frond lanceolate, simply pinnatifid, 9–12 in. long, ¾ in. broad, thick in texture, green and pubescent on both surfaces, narrowed gradually to the base, cut down to a narrowly-winged rachis into very numerous crowded rather ascending entire primary segments, $\frac{1}{8}$–$\frac{1}{6}$ in. broad. Veins obscure, immersed. Sori globose, medial, superficial, reaching from the base to the tip of the segments, 14–16 to the central segments.—Allied to the New Caledonian *P. crassifrons* and the Himalayan *P. khasyanum*.

SHORT NOTE.

Orchis Morio with two Columns.—Early in May I picked up a specimen of this Orchis with a double column. Duplication of parts amongst exotic Orchids is frequent, and, when sepals and petals are doubled, the phenomenon is explained as a separation of the component parts of the column. But duplication of the latter must be explained in another way. Both in the present instance were of equal size and appearance, each bearing an anther containing two pollen masses, and were separated about half-way to the base. Both diverged from the same point with their midribs evidently formed by the splitting or division of one vascular bundle. In one anther the pollen masses were perfect, with their caudicles united to one gland, while in the other case one pollen mass was perfect, while its companion had neither caudicle nor gland. A small flesh-coloured projecting process occupied the position that should have been held by the caudicle, obstructing the passage towards the solitary pouch-shaped rostellum. The flower as a whole was large, but otherwise normal in all its parts. —J. Fraser.

NOTICES OF BOOKS.

A NEW 'LONDON CATALOGUE.'

The London Catalogue of British Plants. Part i. Containing the British [and Irish] Phænogamia, Filices, Equisetaceæ, Lycopodiaceæ, Selaginellaceæ, Marsileaceæ, and Characeæ. Eighth Edition. [Edited by FREDERICK J. HANBURY]. London: Bell & Sons. 8vo, pp. 38. Price 6*d.*; cloth, 1*s.*; Generic index on card, 2*d.*

IN producing this small work Mr. Hanbury has performed a great service. The want of a new London Catalogue has long been felt—to use a stereotyped expression which in this case is strictly accurate—but it could hardly have been hoped that the want would have been so thoroughly supplied. No edition had appeared since 1874—for we may ignore, save as a literary curiosity, the so-called "eighth edition," issued in 1883, which was a mere reprint of the preceding, and invited "inquirers" to address their remarks to the compiler, Mr. Watson, who had been two years dead!

We can well understand that at first this Catalogue will create a certain amount of dismay and bewilderment. Cardinal Newman, in a well-known passage, describes the astonishment of "beneficed clergymen" at the exalted view taken by the 'Christian Year' of their privileges and responsibilities: and similar wonderment will fall on those who suddenly become aware that they must take into their nomenclature *Fibichia* and *Sieglingia* in place of *Cynodon* and *Triodia*; that *Chlora* must give way to *Blackstonia*; that *Elisma* is not a misprint for *Alisma*, and the like. Mr. Hanbury has considerately added in brackets the more accustomed names in many of these cases; but in the species, where no such help is given, the puzzlement will be even greater, although the absence of familiar names will give a clue to those which have been substituted for them. But we doubt if most British botanists would know offhand what was meant by *Scirpus Caricis*, *Linaria viscida*, *Helianthemum Chamæcistus*, *Calluna Erica*, *Arenaria sulcata*, *Calamintha arvensis*, and very many more; and some may be glad to find an explanation of these on p. 282 of this Journal for 1884.

And this brings us to a point on which we think it our duty to enter a protest. For some years we have neglected no opportunity of advancing what we believe to be the right principles of botanical nomenclature. That the oldest name must ultimately be the accepted name for a plant, provided that it agrees with revised limitations of genera and species, is the only sound foundation upon which the structure of correct nomenclature can be raised. Mr. Hanbury has availed himself fully of our work in this direction; but neither to this Journal, without which the Catalogue would not have assumed its present appearance, nor to its Editor, who has more than once been consulted, and who has supplied information additional to that which has been published in these pages, is one word of recognition vouchsafed. "There is not a page in the *Catalogue*," says Mr. Hanbury, "on which the result of [Mr. A. Bennett's]

careful and accurate work and wide experience cannot be traced"; and we may say that there is hardly a page on which Mr. Hanbury's indebtedness to this Journal cannot be detected. A reference to pp. 280–284 of our volume for 1884 will fully justify what we have written. We are willing to believe that the omission is accidental; but we cannot refrain from entering a strong protest against what seems like a pointed ignoring of other workers in the same field.

One paper has escaped Mr. Hanbury's notice, and, as a consequence, the corrections made in it are not included in the new Catalogue. At p. 74 of 'Journ. Bot.' 1881, Mr. Pryor points out that many of the names usually attributed to Linnæus were really given by Hudson. "Linnæus has indeed, in some cases, simply transferred the names of the 'Flora Anglica,' with a due acknowledgment, to his own pages, and can hardly be supposed to have intended that they should be quoted on his own authority." Such are *Trifolium medium*, *Alopecurus bulbosus*, *Dipsacus sylvestris*, *Mentha rotundifolia*, *Mentha hirsuta*, *Scutellaria minor*—all of which must stand as of Hudson; while *Mentha longifolia* Huds., *Agrostis palustris* Huds., and *Trifolium ochroleucon* Huds., must replace *M. sylvestris* L., *A. alba* L., and *T. ochroleucum* L.

Beyond the protest made above, we have little but praise for this new London Catalogue. It is well printed, and attractively got up; and, being quite indispensable to workers, will do more to bring into use the correct nomenclature of British plants than could be accomplished in any other manner. The numbers have of course been rearranged; they run to 1858, named varieties, which are very (? too) numerous, not being numbered. The "excluded species" of former editions have disappeared, and this is a distinct improvement, although as a consequence extinctions or errors like *Echinophora* or *Cnicus oleraceus*, casuals like *Datura* or *Lepidium satirum*, and well-known introductions more or less established, rank on a level with *Bellis perennis*. In this respect, however, the present edition accords with the original issue in 1844, the numbers in which amount to 1428. Allowing for a more critical estimate of species and the like, this shows a great advance in our knowledge of British botany since 1844. Even in those days, *Rubi* had begun to be numerous and troublesome; but *Rosa canina* was content with seven varieties, whereas it now runs through the alphabet, with six in addition. And in 1884 there were no Charas; now we have twenty-six species, with many varieties. Comparisons of this sort are very interesting and suggestive; but space will not allow us to pursue them.

Mr. Hanbury has been fortunate in receiving help in special groups from those most fitted to give it. Prof. Babington has revised the *Rubi*—and, our readers will be glad to know, has prepared a series of notes on the list for this Journal. Mr. Baker takes the Roses; Mr. Bennett has done *Potamogeton*; and the Messrs. Groves the *Characeæ*. The introductory explanations are well done, and merit careful reading: but we find no key to the meaning of the various ways of citing authorities for names, such as "(Jord.)," "(Wats.), Bab."; "("Lam.")"; "L. (ex p.) Fr."; ""Poll.""; ""Breb.," Towns.": only the first of these is explained. The

generic sequence being that of the 'Genera Plantarum,' *Oxycoccus palustris* Pers. (or rather *Schollera Occycoccus* Roth) should replace *Vaccinium Oxycoccus* L.; Gray, not Salisbury, is the authority for *Moneses grandiflora;* Aiton, not Willdenow, for *Cyclamen hederæfolium; Erica Mackayi* should be spelt *Mackaii.* "Læstid." occurs more than once for "Laestad."; "Leysse" is not a good abbreviation for Leysser: but the number of misprints or errors is singularly few. Some of the varieties have odd names, such as "Silene gallica c. anglica × quinquevulnera, Melvill"; but as most authors agree in regarding *S. gallica*, *S. anglica*, and *S. quinquevulnera* as forms of one species, the name is perhaps not odder than the variety. Some entries are puzzling, such as "Rumex 1236 hybridi, "teste Trimen"," followed by seven hybrids; "Agropyron acutum, non R. & S.," no authority being given; and the odd two-line prefix to the list of Ferns,

"Bot. Ang. Ed. tertia.
Gen. Seq. Hooker."

We should like to know more about such entries as "Botrychium 1810 (lanceolatum, Angström)?"; "Asplenium Clermontæ, Syme" —a very doubtful plant according to our way of thinking—should have the "I." for Ireland appended to its name. "Deschampsia setacea, mihi" (*Aira uliginosa* Weihe) is, we presume, to be quoted as of F. J. Hanbury; but this is open to question, as Mr. Hanbury only styles himself editor, and the work is by several hands. The black line down the middle of each page, and the period after each generic name separating it from the species which follow, are details of typography which do not commend themselves to us.

The "Generic Index on card," and the shilling issue in limp cloth and on stouter paper are useful and practical. We shall be glad to know that the present issue of the Catalogue is exhausted, so that a still more satisfactory edition may take its place.

Hymenomycetes Britannici: British Fungi (Hymenomycetes). By the Rev. John Stevenson. Vol. i. Blackwood & Sons. 1886. 8vo, pp. 372, 39 cuts.

This is the first of two volumes of a work intended to supply the English student with a description, in his own language, of every species of fungi belonging to the *Hymenomycetes* discovered in Britain up to the present time. Mr. Stevenson is the author of a work on the Fungi of Scotland—'Mycologia Scotica,'—and is known as a very ardent and critical field worker—an indispensable qualification in dealing with these short-lived and variable plants. The appearance of a work of this nature is an event of some importance, when we consider how few books we have in our literature on the subject. It is now just fifty years (1836) since vol. v., part 2 of 'English Flora,' by the Rev. M. J. Berkeley, was published, comprising all the then known British species of Fungi. Twenty-four years elapsed when 'Outlines of British Fungology' appeared (1860), by the same author, confined mainly to the *Hymenomycetes* and some of the larger *Ascomycetes.* Eleven years

later, Cooke's 'Handbook of British Fungi' made its appearance (1871), containing descriptions of every species known up to the date of publication. Thus it is seen that half a century has yielded but three works in our language adapted to the wants of a botanical student seeking to master the difficulties presented by the larger fungi. Cooke's 'Handbook' is now out of print, besides being to a great extent rendered obsolete by the progress of discovery; hence it is no small advantage to those acquainted only with the English language, that two men so eminently fitted for the task as the author of the present work and Dr. Cooke, who is issuing his valuable 'Illustrations of British Fungi,' should be engaged in supplying the existing demand.

Mr. Stevenson's book affords a striking illustration of the progress made in the study of Mycology during the last fifteen years, that is, from the date of the publication of Cooke's 'Handbook,' to the present time. Let us see what it amounts to. Four genera are included in this volume, one of which may be left out of account, having no representative in Britain. If we take the remaining three, viz., *Agaricus*, *Coprinus* and *Bolbitius*, and compare the number of species with those of the corresponding genera in Cooke's work, the increase will be at once apparent—

	Cooke.	Stevenson.
Agaricus—		
Leucospori (White-spored) .	230	399
Hyporhodii (Pink-spored) .	58	90
Dermini (Brown-spored) .	100	195
Pratelli (Purple-spored) .	48	75
Coprinarii (Black-spored) .	16	23
Coprinus	28	33
Bolbitius	5	7
Total . .	485	822

Of the 337 species added to our Flora in these three genera, by far the largest proportion have been identified by Messrs. Berkeley and Broome.

The system of classification adopted is that of the late illustrious Professor Fries, of Upsala, which, with slight modifications, is that generally accepted throughout Europe. Each sub-genus is illustrated by a woodcut of some typical species having the well-known initials "W. G. S." which signature is a sufficient guarantee of their accuracy. It is to be regretted, however, that regard to space has necessitated the reduction of many of these to much below their natural size, for size cannot be altogether disregarded; at the same time it will not be denied that the dimensions being given of both pileus and stem will serve to correct any false impression made by the figures. A departure has been made from the usual practice in the description of species, which the author anticipates will provoke some criticism. Instead of giving a brief *diagnosis*, followed by a *description*, he has thought it better to embody the whole of the character in one description, after the

manner of Fries in his 'Monographia Hymenomycetum Sueciæ.' Two arguments may be urged in favour of this method; first, that it enables the author to incorporate the results of his own personal observations in a more succinct form; secondly, the book is rendered somewhat more popular in its character. We have turned to many of the most well-known species and find the descriptions clear and accurate. The dimensions of the pileus and stem are given both in centimetres and inches, and when the microscopic measurement of the spores is given it is in micromillimetres and decimals of an inch. We remark, in some few cases, a striking disparity in spore measurements, leading to the conclusion that those responsible for them must have had different species under observation, as, for example, in the following:—*Agaricus virosus*, *A. vaginatus*, *A. stellatus*, *A. porrigens*, *A. physaloides* and *A. micaceus*, which are selected at random. Convinced as we are of the value of carefully-taken measurements of spores, we are pleased to see so many given in this work, as we consider it a step in the right direction.

We cordially recommend this work to all engaged in the study of fungi, as a reliable and convenient manual. It is remarkably free from typographical errors, printed on good paper, and furnished with an excellent index; and we shall hail the appearance of the second volume with much pleasure.

W. Phillips.

A useful 'Handbook of Plant Dissection' comes to us from New York (Henry Holt & Co.: 8vo, pp. xi. 256, tt. 2), being the joint work of the editors of our contemporary the 'Botanical Gazette,' Messrs. J. C. Arthur, C. R. Barnes, and J. M. Coulter. It is an extremely practical work, admirably printed, well indexed, and easy to consult. The editors say, "Although the present work is based on Huxley and Martin's ['Elementary Biology'] in form and treatment for the laboratory part, it differs in excluding all matters of physiology so far as possible, as the present demands of vegetable physiology will hardly permit harmonious treatment along with a course of dissection." This 'Handbook' will be found a most useful companion to the various advanced manuals issued of late years both in this country and in the United States. The plants selected for treatment are: *Protococcus viridis*, *Oscillatoria tenuis*, *Spirogyra quinina*, *Cystopus candidus*, *Microsphæria Friesii*, *Marchantia polymorpha*, *Atrichum undulatum*, *Adiantum pedatum*, *Pinus sylvestris*, *Avena sativa*, *Trillium recurvatum*, *Capsella Bursa-pastoris*.

We have received from the author, M. E. Drake del Castillo, the first part of a handsome quarto work entitled 'Illustrationes Floræ Insularum Maris Pacifici' (Paris, Masson). The interesting introduction gives a brief but comprehensive sketch of the leading features of the vegetation of these islands, and of those who have mainly contributed to our knowledge of it: we note that the drawings of G. Forster, about which we spoke at some length in this Journal for 1885 (pp. 163, 164), are erroneously stated to be "au Musée de Kew." The plants (admirably figured by d'Apreval) in

this number are: *Berrya Vescoana* Baill., *Evodia sericea*, sp. n., *E. nodulosa*, sp. n., *E. auriculata* (*Melicope auriculata* Nad.), *E. emarginata*, sp. n., *E. Lepinei* Baill., sp. n., *Sclerotheca arborea* A. DC., *S. Forsteri*, sp. n., *Apetahia raiateensis* Baill., *Alstonia costata* Br.

The fourth volume of Prof. Saccardo's great work, 'Sylloge Fungorum (Hyphomycetes)' has appeared; we hope to give additional notice of it later on.

New Books. — H. Lüscher, 'Verzeichniss der Gefässpflanzen von Zofingen und Umgebung' (Sauerländer, Aaran: 8vo, pp. 103). — A. Engler, 'Führer durch den Königlich Botanischen Garten zu Breslau' (Breslau, Kern: 8vo, pp. 121: 80 *pf.*).—A. Franchet, 'Flore de Loire-et-Cher' (Blois, Contant: 8vo, pp. lxxviii, 15*, 792). —L. Mangin, 'Cours Élémentaire de Botanique' (Paris, Hachette: 8vo, pp. ii. 382: 446 cuts, 2 plates). — J. A. Palmer, 'Mushrooms of America, edible and poisonous' (Boston, Prang: 4to, pp. 4, tt. 12).

Articles in Journals.

Bot. Centralblatt. (No. 12). — K. Keilhack, 'Die isländische Thermalflora.' — (No. 14). P. E. Müller, 'Bemerkungen über die *Mycorhiza* der Buche.'—(No. 15). K. Keilhack, 'Die norddeutsche Diluvialflora.'—(Nos. 16–19). J. Wiesbaur, 'Prioritätszweifel über *Dianthus Lumnitzeri* und *Viola Wiesbauriana*.' — (No. 20). J. B. Schnetzler, 'Ergänzung meiner vorläufigen Notiz über ein Moos des Genfersees.' — (Nos. 21–23). K. von Tubeuf, '*Cucurbitaria Laburni* & *Cytisus Laburnum*' (1 plate).

Botanical Gazette (May). — E. Hackel, '*Scribneria*, gen. nov.' (Gramineæ, Hordeæ: 1 plate). — J. M. Coulter, 'Revision of N. American Hypericaceæ.'—G. Vasey, 'Notes on *Eatonia*' (*E. Dudleyi*, *E. filiformis* (= *E. pennsylvanica* var. *filiformis* Chapm.), spp. nn.).

Bot. Zeitung. (Ap. 30–May 21). — J. Wortmann, 'Theorie des Windens.' — (May 7). L. Errera, 'Ueber den Nachweis des Glycogens bei Pilzen.'

Botaniska Notiser (häft. 3).—A. Vinge, 'Om arbetsfördelningen hos s. k. skuggblad.' — C. Kaurin, *Cladodium Limprichtii* n. sp. — H. W. Arnell, 'Bryologiska notiser från Vesternorrlands län.'

Bull. Soc. Bot. France (xxxiii. Comptes rendus, 2. May 1). — A. Franchet, 'Primula de la Chine et du Thibet' (*P. heucheræfolia*, *P. malvacea*, *P. oreodoxa*, *P. Davidi*, *P. oralifolia*, *P. moupinensis*, *P. Poissoni*, *P. membranifolia*, *P. nutans*, *P. incisa*, spp. nn.).— E. Bureau, *Dorstenia Massoni*, n. sp. (1 plate). — P. van Tieghem, 'Sur l'appareil sécréteur et les affinités de structure des Nymphéacées.' — Id., 'Structure de la tige des Primevères nouvelles du Yun-nan.'—J. de Seynes, *Mycenastrum Dugesii*, n. sp.—P. Vuillemin, 'L'Exoderme.' — P. Duchartre, 'Sur un Bégonia qui produit des inflorescences épiphylles.' — L. Dufour, 'Influence de la lumière sur la structure des feuilles.' — A. Franchet, 'Sur les espèces du genre *Epimedium*' (concl.). — T. Caruel, 'Classification des fruits.' —E. Mer, 'Sur la répartition des Stomates.'

Bull. Torrey Bot. Club (May).—J. S. Newbery, *Bauhinia cretacea*, n. sp. (from the Cretaceous Clays of N. Jersey: 1 plate).

Flora (Ap. 1, 11). — F. Buchenau, 'Die Juncaceen aus Mittelamerika.'—W. Nylander, 'Lichenes insulæ San Thomé.'—(Ap. 21). J. Röll, 'Zur Systematik der Torfmoose.' — P. G. Strobl, 'Flora der Nebroden.' — (May 1, 11). K. F. Jordan, 'Die Stellung der Honigbehälter und der Befruchtungswerkzenge in den Blumen' (2 plates).

Gardeners' Chronicle (May 1). — W. S. Mitchell, 'The origin of the Potato.'—*Cypripedium Sanderianum* Rchb. f., n. sp.—M. Foster, '*Iris Cengialti.*' — W. G. Smith, 'Poisoning by *Agaricus dealbatus*' (fig. 121). — Id., 'Primula Disease' (figs. 124, 125). — *Syringa japonica* (fig. 123). — (May 8). *Thrixspermum indusiatum* Rchb. f., n. sp.—W. G. Smith, '*Torula sporendonema*' (fig. 133).—(May 15). *Oncidium pardoglossum* Rchb. f., n. sp. — '*Oidium Tuckeri*' (figs. 136–140). — (May 22). *Adiantum Birkenheadii* T. Moore, n. sp.—*Epidendrum fraudulentum* Rchb. f., n. sp. — Portrait of E. Morren. —C. S. Sargent, 'Larches of Western N. America' (figs. 145, 146). —M. T. Masters, '*Napoleona*' (fig. 147). — (May 29). *Maxillaria Endresii* Rchb. f., n. sp., *Fritillaria contorta* Hort., *Adiantum Collisii*, n. hyb. ? — A double *Fedia* (fig. 136).

Journ. Linn. Soc. (Nos. 143–4, Ap. 30). — M. T. Masters, 'Contributions to the History of certain Conifers' (9 plates).—(No. 150, May 20). F. B. Forbes & W. B. Hemsley, 'Index Floræ Sinensis,' part i. (*Ranunculus Polii* Franchet, *Melodorum Oldhami*, *Viola Rossii*, *V. Websteri*, *Polygala fallax*, *P. hongkongensis*, *P. Mariesii*, *Stellaria rhaphanorrhiza*, *Eurya distichophylla*, *Saurauja Oldhami*, spp. nn., all of Hemsley).

Magyar Növénytani Lapok. (April). — H. Sabransky, 'Rosæ ditionis Posoniensis.'

Oesterr. Bot. Zeitschrift. — H. Braun, '*Rosa petrophila* Borb. & H. Braun.' — E. Woloszczak, 'Ein für Galizien neuer Cytisus.'—M. Kronfeld, 'Bemerkungen über volksthümliche Pflanzennamen.' —K. Vaudus, 'Zur Flora Wolhyniens.' — E. Palla, 'Flora von Kremsier.' — P. G. Strobl, 'Flora des Etna.'

LINNEAN SOCIETY OF LONDON.

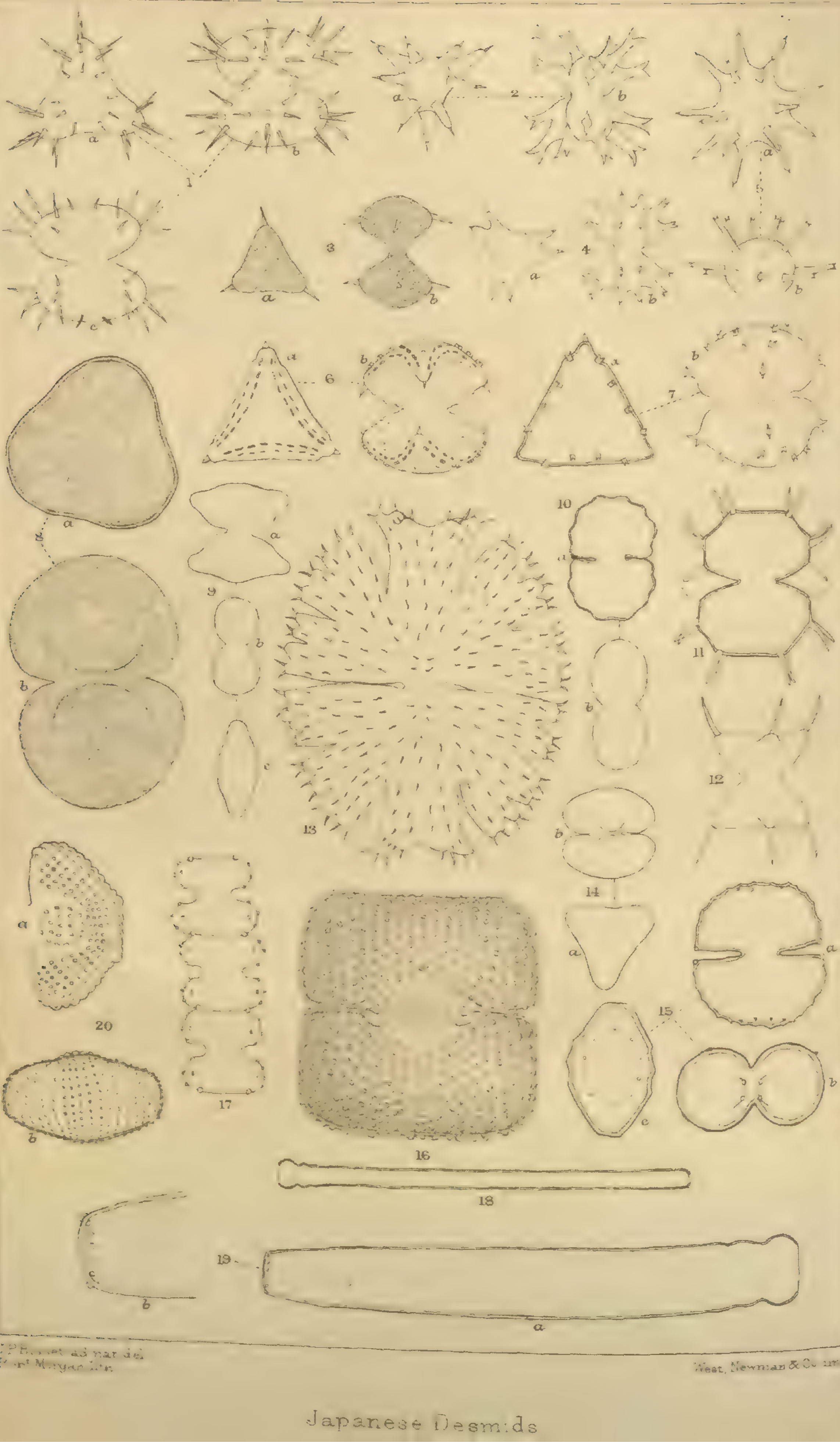
April 15. — W. T. T. Dyer, Esq., Vice-President, in the chair. —Mr. Rochfort Connor, of Greenock, was elected a Fellow of the Society. — Specimens of living *Dendrobium densiflorum* and *D. suavissimum* were shown by Mr. E. A. Heath; and Mr. J. G. Baker exhibited drawings of new and remarkable Ferns in illustration of the Roraima Report. — The third part of a List of Fungi from Queensland and other parts of Australia, with Descriptions of New Species, by Mr. C. E. Broome, was read in abstract. — Afterwards Mr. Everard F. im Thurn gave the gist of an extended report on the plants collected by him during his recent first ascent of Mount Roraima, in British Guiana. The specimens had been examined and identified by Prof. Oliver, Mr. J. G. Baker, M. Marchal, and Mr. Ridley; three new genera and fifty new species had been described, while a few others yet awaited determination. A yet

larger number of new forms would probably have been procured, but that the collection was made at the same period of the year at which the brothers Schomburgh and the German botanist, Karl Appun, had previously collected on the mountain. The country of Guiana was described as rising by a series of distinctly-marked ascents from the level of the Atlantic Ocean on its east, to the high table-land of the centre of that part of South America on the west. The group of vast sandstone columns, of which Roraima is the best known, stands really in the Brazils, just beyond the westernmost part of Guiana; and from its summit pour down streams which flow in very diverse directions to feed the Orinoco, the Esequibo, and the Amazon. It is therefore a centre from which any peculiar vegetable forms which might have originated there might easily distribute themselves over a very vast extent of country. Regarding the flora of Guiana as a whole, three distinct zones of vegetation may be distinguished: that of the cultivated strip of coast-land; that of the forest which clothes the upward slope of the country; and that of the high savannah-land of the interior. Within each of these zones its own peculiar species are remarkably evenly distributed; but occasionally, especially on the savannah, this uniformity of vegetation is interrupted by the occurrence of small tracts of peculiar vegetation. Sometimes these tracts are marked by the occurrence of only one peculiar species, and these Mr. im Thurn distinguished under the name of "areas of localised species." Sometimes they are marked by the occurrence of a very large number of peculiar species, almost to the exclusion of the more usual species, and these latter tracts were spoken of as areas of distinct vegetation. Of the latter kind the two most marked instances in British Guiana are the savannah above the Kaieteur Fall and Roraima itself. The remarkable fact was pointed out that the vegetation of these two areas, so distinct from that of the country which surrounds each of them and separates the two, is in certain strongly-marked features common to the two, and that the species common and peculiar to these two areas vary remarkably in many characters in the two areas. It was also pointed out that a few other such small areas as yet unexplored exist, and will one day be found clearly to resemble Roraima and the Kaieteur. A map of the route traversed and coloured drawings of the country and aspects of the vegetation were exhibited in illustration of the paper.

May 6. — Sir John Lubbock, Bart., President, in the chair.— Prof. Henry Marshall Ward was elected a Fellow of the Society.— The following Auditors were nominated: Mr. J. Jenner Weir and Mr. Fred. V. Dickens for the Fellows, and Mr. Thos. Christy and Mr. Francis B. Forbes for the Council. — Dr. Charles Cogswell drew attention to framed water-coloured drawings of *Lettsomia aggregata* and *Fothergilla gardenia*, botanical mementos of the two distinguished physicians, Drs. Lettsom and Fothergill.—Sir John Lubbock's paper, "On Forms of Seedlings," was by request adjourned, so as to give opportunity for Mr. Romanes' communication.—Mr. Geo. J. Romanes then read his paper, "On Physiological Selection; an additional suggestion on the Origin of Species." He considered that, as a theory

of the origin of species, natural selection encounters three cardinal difficulties: (1) it cannot explain sterility between species, or the primary specific distribution; (2) it cannot explain many among the secondary specific distinctions, or those trivial details of structure which, while serving to distinguish one species from another, present no meaning of an utilitarian kind; (3) natural selection must always be so heavily handicapped by the swamping effects of intercrossing upon any new variation that, unless such intercrossing is in some way prevented, we may reasonably doubt whether natural selection alone could change one *species* into another in more than a very small percentage of cases, although, when intercrossing is prevented by the bar of sterility between species, natural selection may afterwards produce genera, families, orders, and classes. In view of these considerations the author contended that the theory of natural selection has been misnamed a theory of the origin of species. It is, in truth, a theory of the origin of adaptive structures; and, if unassisted by any other principle, could not effect the evolution of species. The only other principle that could here assist natural selection would be one that might mitigate the swamping effects of intercrossing. This may be done by geographical barriers shutting off a portion of a species from the rest, and on allowing that portion to develop an independent course of varietal history without intercrossing with the parent form. It may also be done by portions of species migrating, changing habitual stations, &c. But it may also be done by what the author calls physiological selection, or in virtue of a variation taking place in the reproductive system in the direction of sterility (whether absolute or partial) with the parent form, without unpairment of fertility within the varietal form. For instance, the season of flowering or of pairing may be either advanced or retarded in a portion of a species when all the individuals in that portion (or new variety) would be absolutely sterile towards the rest of the species, while completely fertile among themselves. They would thus start on an independent course of variated history. Sundry other causes (both entrinsic and intrinsic) may determine this particular variation in the reproductive system; and wherever it does occur it must give rise to a new species to record the fact. The proof of its occurrence is furnished both among our domesticated varieties and in Nature. It explains the sterility between species, the frequent inutility of other specific characteristics, and entirely escapes the difficulty from intercrossing. It therefore relieves the theory of natural selection from all the disabilities under which it lies, in consequence of having been improperly formed to pose as a theory of the origin of species. — The paper, "On new species of the genus *Metzgeria*," by William Mitten, A.L.S., was afterwards read in abstract.

We learn with much satisfaction that Mr. George Nicholson has been appointed to succeed Mr. John Smith as Curator of the Royal Gardens, Kew. Mr. William Watson has been appointed Assistant Curator.



J. P. Bennet ad nat. del.
West, Newman & Co. imp.

Japanese Desmids

NOTES ON JAPANESE DESMIDS.—No. I.

By John Roy and J. P. Bisset.

(Plate 268).

Although much attention has been devoted to the very interesting general Flora of Japan, no contribution appears to have been made to the Desmid-flora of the country, excepting the description of one species (*Closterium japonicum*) in Suringar's 'Algæ Japonicæ,' published at Haarlem in 1870. The authors have therefore thought it desirable to place on record the results, thus far, of their examination of two small collections from Japan.

In 1876 one of the authors brought home a small quantity of material, washed out of specimens of *Utricularia* gathered on the Rifle Range at Yokohama, and in it were found the Desmids now recorded as from that district.

In September last Mr. James Bisset, F.L.S., of Yokohama, during a short stay at Hakodate, in the Island of Yesso, visited a lake about twenty miles distant, called by the natives the "Junsai numa," or Brasenia Lake, *Junsai* being the Japanese name of *Brasenia peltata*, which abounds in the Lake. Along with *Brasenia* he also found *Nuphar japonicum*, *Nymphæa tetragona*, *Typha japonica*, *Myriophyllum*, &c. By stripping such water-plants he secured a small quantity of material, in which the authors have found a considerable number of Desmids, many of which are of the usual cosmopolitan species, although the absence of many such species is noteworthy. Among the forms noticed there are, however, some of great rarity: e. g. *Staurastrum corniculatum* Lund., *S. leptodermum* Lund., *S. Hantzchii* Reinsch, *Euastrum sibiricum* Boldt, *Cosmarium striatum* Boldt, *S. tunguscanum* Boldt (the three last-named first described by Robert Boldt at Stockholm in February, 1885, as having been found in Siberia, in 'Bidrag till Kännedomen om Sibiriens Chlorophyllophycéer'), and a considerable number of supposed new forms here described for the first time, leaving some to be noticed in a future paper.

I. Micrasterias Ag.

1. *M. denticulata* Breb. Junsai numa.
2. *M. rotata* (Grev.) Ralfs. Junsai numa.
3. *M. apiculata* (Ehrb.) Menegh. Long. (ex. sp.) 220 μ; lat. (ex. sp.) 180 μ; isth. 35 μ. Fig. 13.
4. *M. Crux-melitensis* (Ehrb.) Ralfs. Junsai numa and Yokohama.
5. *M. decemdentata* Näg. Junsai numa.
6. *M. pinnatifida* (Kütz.) Ralfs. Junsai numa.

II. Euastrum Ehrb.

1. *E. verrucosum* Ehrb. Yokohama.

2. *E. orbiculare* Wallich. Yokohama.
3. *E. spinulosum* Delponte.
   Subsp. *africanum* Nordst. Yokohama.
   Subsp. *inermius* Nordst. Yokohama.
4. *E. oblongum* (Grev.) Ralfs. Junsai numa.
5. *E. ansatum* Ehrb. Junsai numa.
6. *E. elegans* (Breb.) Kütz. Yokohama.
7. *E. sibiricum* Boldt ('Sibiriens Chlorophyllophycéer,' p. 99. Tab. v., fig. 2). Junsai numa.

III. Cosmarium Corda.

1. **C. orthopleurum,** n. sp.—Large, length and breadth equal, deeply constricted, the opening linear, very narrow, general outline square, angles at the base rectangular, sides very slightly convex, almost straight, upper angles rounded, ends straight or very slightly concave; sides and ends closely crenulated. Membrane densely granulose, the granules arranged in perpendicular and slanting series in a quincuncial manner; granules large, each with 6 puncta regularly arranged round, 1 punctum in the centre of the space between 3 granules; there are 22 perpendicular series of 8–10 granules each; at the centre of the base of each semicell is a triangular space without granules, but punctate. Isthmus one-third of the breadth of the semicell, smooth, side and end views not seen. Starch-granules in pairs. Long. and lat. 82–95 μ; isth. 26–30 μ. Fig. 16.

Yokohama.

This fine species bears a general resemblance to *C. quadrum* Lundell, but differs in being a little larger, in the equal length and breadth, in the number of rows of granules, in the puncta between, and in the naked triangular space at the base. The number of the rows of granules, besides other points, separates it still more widely from *C. conspersum* Ralfs, and *C. latum* Breb. α. & β.

2. *C. conspersum* Ralfs. Yokohama.
3. *C. latum* Breb. Yokohama.
4. *C. margaritatum* (*C. latum*, β. *margaritatum* Lundell). Yokohama.
5. *C. Kjellmani* Wille.
   β. *ornatum* Wille. Junsai numa.
6. *C. Botrytis* (Bory) Menegh. Yokohama.
7. **C. fusum,** n. sp.— Medium-sized, about one-seventh longer than broad, constriction deep, narrow, opening out widely into the broadly-rounded lower angles, sides straight, with 11 crenatures, ends sharply truncate, with 7 minute crenatures; in the middle of the semicell, a little above the base, is a pretty large granulated circular protuberance, with about 22 granules, disposed in two concentric circles of 13 and 7 granules, with 2 in the centre; near the protuberance the surface is smooth, elsewhere granulated, the granules radially disposed in rows of 6–7 granules from each crenature; end view narrowly elliptical, with a prominent granulated inflation on each side; isthmus narrow, about one-fourth of

the breadth of the semicell. Long. 40 μ; lat. 35 μ; isth. 9 μ. Fig. 20.

Yokohama.

This bears a considerable general resemblance both to *C. Botrytis* Bory and *C. Kjellmani*, subsp. *grande*, Wille; but the former is much larger, and wants the central inflation; while the latter, besides being larger, has the granules on the central inflation larger than the others, and arranged in five perpendicular rows of five granules each.

8. *C. tetraophthalmum* (Kütz.) Breb. Yokohama.
9. *C. punctulatum* Breb. Yokohama.
10. *C. geminatum* Lundell. Junsai numa.
11. *C. Bœckii* Wille. Junsai numa.
12. *C. Regnesi* Reinsch. Junsai numa.
13. *C. pulcherrimum* Nordst. Junsai numa.
14. *C. crenatum* Ralfs.

Forma *crenis lateralibus* 3. Nordst. Junsai numa.

15. *C. striatum* Boldt (*l. c.* p. 104. Tab. v., fig. 9). Junsai numa.
16. *C. sexangulare* Lundell. Yokohama.

β. MINOR, n. var.—Half the size of the type. Junsai numa.

17. *C. nitidulum* De Not. Yokohama.
18. *C. retusum* (Perty) Rabenh.

β. LÆVE, n. var. — Agreeing closely with Lundell's forma *minor*, but differs in being quite smooth. Long. 28 μ; lat. 22 μ; lat. isth. 7 μ. Junsai numa.

19. **C. capitulum,** n. sp. — Small, about one-tenth broader than long; semicells irregular, twice as broad as long, constriction deep, opening widely, sides drawn out, shortly rounded below, slightly concave, basal angle rounded, above, slightly concave, the semicell suddenly contracted into the short, broadly rounded, almost straight end; side view, semicells circular; end view, elliptical. Isthmus two-thirds of the thickness of the semicell. Membrane smooth. Long 21 μ; lat. 23 μ; isth. 7 μ. Fig. 9.

Junsai numa.

The species which agrees most nearly with this is *C. Regnellii* Wille, which is about the same size, but differs in having the sides less produced, in having the ends straight for three-fourths of the breadth of the semicells, and in having the constriction deep, narrow, and linear.

20. *C. impressulum* Elfving. Fig, 10.
21. *C. Hammeri* Reinsch.

β. *subangustatum* Boldt (*l. c.* p. 101. Tab. v., fig. 3). Junsai numa.

22. *C. Clepsydra* Nordst. (*C. bicardia* Reinsch). Junsai numa.
23. *C. Phaseolus* Breb.

γ. *achondrum* Boldt (*l. c.* p. 103. Tab. v., fig. 7). Junsai numa.

24. *C. galeritum* Nordst.

β. *minus* Wille. The Japanese form is slightly smaller than the South American. Long. 31 μ; lat. 30 μ; isth. 7 μ. Junsai numa.

25. *C. obsoletum* (Hantz) Reinsch. Junsai numa.

26. *C. depressum* Bailey. Junsai numa.

27. **C. decachondrum,** n. sp.—Small, subundulated, as long as broad, almost circular in outline, ends slightly truncate, close to which are a row of minute spines, of which 5–6 are visible in front view; base of semicells straight, the opening between them slightly widening outwards, but narrowed at the extremity by a papilla at each angle, sides with about four very shallow undulations; in side view semicells are circular, with a minute spine on each side, near the ends; lower, a distinct thickening of the membrane on each side and close to the isthmus, two papillæ, slightly apart, one on each side of the middle; end view elliptical, with ends truncate; and three slight prominences on each side, and with ten minute spines arranged in an oval around the centre. Long. and lat. 30 μ; lat. isth. 9 μ. Fig. 15.

Junsai numa.

This species is near *C. taxichondrum* Lundell, *β. subundatum* Boldt; but that form wants the minute spines near the ends, and this wants the granule at the base, close to the isthmus, as well as the three parallel to the base on the middle of the semicell. A var. of it is a little more truncate.

28. *C. pachydermum* Lundell. Yokohama and Junsai numa.

29. *C. pseudopyramidatum* Lundell.

Subsp. ***stenonotum*** Nordst. Yokohama.

30. *C. pygmæum* Archer. Junsai numa.

31. *C. Meneghinii* Breb. Junsai numa.

32. *C. moniliforme* (Turp.) Ralfs. Junsai numa.

33. *C. connatum* Breb. Junsai numa.

34. *C. excavatum* Nordst. Junsai numa.

35. *C. Portianum* Archer. Junsai numa.

36. *C. turgidum* Breb. Yokohama and Junsai numa.

37. *C. striolatum* (Näg.) Archer. Junsai numa. Long. 135 μ: lat. 65 μ; isth. 55 μ. The Japanese form agrees precisely with Lundell's diagnosis of this fine species ('De Desmid.,' p. 53). *Calocylindrus Cohnii* Kirch. and *Diophyntium tessellatum* Delponte form apparently one species, and only differ from this in being non-punctate.

IV. Arthrodesmus Ehrb.

1. *A. convergens* Ehrb. Junsai numa.
2. *A. bifidus* Breb. Junsai numa.
3. *A. octocornis* Ehrb.

a. Ralfs. Junsai numa.

(To be continued.)

NEW OR NOTEWORTHY FUNGI:—Part III.

By W. B. Grove, B.A.

(Plates 266 & 267).

(Concluded from p. 137.)

PSEUDODIPLODIA Karsten.

Perithecia superficial, globular or oblong, waxy-fleshy, when moist dark coloured, soon opening with a wide mouth. Sporules ellipsoid, 1-septate, dilute olivaceous.

101. **Pseudodiplodia corticis.** sp. n. — P. late effusa; perithecis gregariis v. in lineas breves aut maculas contractis, 1–1·4 mm. diam.; globulosis v. oblongis, lævibus, nitidis, contextu ceraceo molli olivaceo subferrugineo minute celluloso, emergentibus, denique semisuperficialibus, siccis atro-fuscis, poro pertusis exiguo qui celeriter dilatatur, subinde phacidiiformiter v. hysteriiformiter laceratis, nox parte superiori prorsus evanidis; nucleo olivaceo, senio (disco) subnigro; sporulis oblongis, subfusoideis, utrinque obtusis v. basi aut apice acutatis, rarius curvulis, diu continuis, dein senioribus tenuiter 1-septatis, vix constrictis, vix guttulatis, singulis hyalinis, coacervatis dilute olivaceis, 10–14 $\mu \times 3$–4 μ, basidiis subramosis fasciculatis 2–3-plo longioribus suffultis. (Tab. 266, fig. 6).

In pagina interiori corticis v. etiam in ligno *Aceris pseudo-platani*, "Sutton Coldfield" (Wk.), Dec.—Feb. A *P. ligniaria* Karst. (Sacc. Syll. iii. 621) differt loco natali, sporulis duplo angustioribus, sed imprimis peritheciorum magnitudine quæ 5–7-plo majora. Num vere e Nectrioideis sit, in dubio habendum censeo.

**Discula microsperma* Sacc. Syll. iii. 675 (1884).— *Discella microsperma* B. & Br. Ann. N. H. (1850).

Sporules linear, hyaline, sometimes curved, 5–6 $\mu \times 1$ μ.

On twigs of osier woven into basket-work, Sutton Coldfield, Dec. On the same basket-work, if not on the same twigs, I found also *Discella carbonacea* B. & Br. and *Diplodia salicina* Lev.

**Didymosporium profusum* Fr. S. Myc. iii. 487 (1832); Sacc. Syll. iii. 763 (1884). — *Stilbospora profusa* Grev. S. Cr. Fl. t. 212, f. 1 (1826).

Pustules gregarious, ·4–·7 mm. diam., conical, subcutaneous, black, bursting in the centre; conidia small, ovoid-oblong, 1-septate, at first hyaline, then olivaceous, at length dark fuscous, somewhat constricted, rounded at each end or more tapering below, 20–25 $\mu \times 9$–10 μ.

On inside of bark of *Acer Pseudoplatanus*, Sutton Coldfield (Wk.) Dec. This may almost be regarded as an addition to our Flora, for though figured by Greville so long ago, it has been omitted from all the writings of British mycologists since that time, even from the 'Mycologia Scotica' of Rev. John Stevenson (1879), and the additions thereto published in the 'Scottish Naturalist.'

102. *Pestalozzia longiseta* Speg. Mich. i. 478 (1879); Sacc. Fung. It. 1120 (1881); Syll. Fung. iii. 787 (1884).

Acervuli numerous, globose-lenticular, hypophyllous, subepidermal, then erumpent in a globule, and finally covering the leaf with a broad black stain; spots none. Conidia elliptic-fusiform, sometimes curved, 25–30 μ × 8–9 μ, 4-septate; uppermost loculus conoid, hyaline, bearing 3 long divergent hyaline setæ, 35–45 μ × 1 μ; 3 middle loculi brown, the two upper ones darker and sometimes quite opaque, the lower pale yellowish brown; lowest loculus conoid, rather longer than the uppermost one, hyaline; basidium short, hyaline, 8 μ × 1 μ.

On Azalea-leaves, Sutton (Wk.), Sept. Verging towards *P. versicolor* Speg., which is perhaps not truly distinct. Recorded also on leaves of *Sorbus torminalis* and *Rubus cæsius*.

103. **Pestalozzia fibricola,** sp. n. — P. acervulis parvis, gregariis, fibras elevantibus, quæ demum poro pertusæ; conidiis erumpentibus, elliptico-fusiformibus, 4-septatis, 17–18 μ × 5 μ; loculis 3 interioribus olivaceis, sæpe guttulatis; medio saturatiori; supremo hyalino, conoideo, elongato, 4–5 μ alt., setas 1–3 hyalinas, 12–18 μ longas, patenti-recurvas gerente; infimo hyalino, brevi, triangulari; basidiis brevissimis, 3 μ × ·5 μ. (Tab. 266, fig. 7).

Inter fibras *libri Tiliæ* ad usum horti cultorum parati, Sutton (Wk.), Sept. Cum plantis e Germania sine dubio importata. Species hæc loculo medio conidiorum saturatiori, at non opaco, a *P. longiseta* distincta. Setæ inter se basin versus breviter connatæ. Sæpissime 2 setæ inveniuntur; quum unica, solito est longior et oblique curvata. Loculus (? an recte sic nominatur) supremus una cum setis decidit. Cum *P. funereæ* var. *discolori* comparanda species.

GEOTRICHUM Link (1809).

Hyphæ short. Conidia concatenate, shortly cylindrical, truncate at each end, hyaline or brightly coloured.

104. **Geotrichum roseum,** sp. n. — G. hyphis repentibus, intricatis, albis; conidiis catenulatis, breviter cylindricis, utrinque abrupte rotundatis v. truncatis, basidiis brevissimis erectis suffultis, dilute roseis, 16–30 μ × 9–10 μ. (Tab. 266, fig. 8).

Ad basin culmorum *Junci*, maculas parvas rotundatas v. oblongas densas roseas efformans, socia *Peziza Curreiana*, "Sutton Park" (Wk.), Jan.

105. *Fusidium lycotropum* Pr. St. Deutsch. Fl. xxix. 57, t. 29 (1851).

White, thinly effused; conidia curved like a horse-shoe, hyaline, fusiform, obtuse at each end, 2–4-guttulate, 18–20 μ long, 3 μ broad, the two inner guttulæ almost always very large.

On rotting stem of *Carduus palustris*, Little Sutton (Wk.), Oct. The conidia are bent so as sometimes to form nearly a complete circle, 7–8 μ in diameter. I was not able to observe them concatenate, so that the genus is rather dubious.

106. **Septocylindrium pallidum,** sp. n. — S. conidiorum catenis brevibus, strictis, simplicibus, raro furcatis, fasciculos pallidos circa ostiola *Diatrypis* efformantibus; conidiis pallidis, 3-septatis (maturis), 25–40 μ × 5–6 μ, utrinque acutatis, isthmo tenui manifesto connexis; basidiis conidii longitudinem æquantibus v. paulo superantibus, vix (1–2) septatis, angustioribus, subsaturatioribus. (Tab. 266, fig. 12).

In ostiolis *Diatrypis stigmatis*, nec *Eutypæ* ut temere dixeram, "Blackwell" (Ws.), Mar. Dubium potest judicari utrum cum Septocylindriis an cum Septonematibus adnumerandum.

107, **Septocylindrium chætospira,** sp. n.—S. subfasciculatum v. gregarium, album; catenis conidiorum erectis, eximie helicoideis, ad instar Infusorii *Chætospiræ* (unde nomen), 200–250 μ alt.; conidiis uniseptatis, dein 3-septatis, cylindricis, utrinque subacutis, subinde curvulis, hyalinis, 20–25 μ × 2$\frac{1}{2}$–3 μ; basidiis nullis v. non visis. (Tab. 266, fig. 11).

In ligno putri, "Streetly" (St.), Oct., una cum *Catenularia simplici* (q. v.). Species catenis more instrumenti "cork-screw" dicti contortis facile distincta.

108. *Sporotrichum merdarium* Link, Jahrb. i. 176 (1819); Sp. Pl. i. 10 (1824); Sacc. Mich. ii. 359 (1881)—non Harz, Neu. Hyph. p. 21, sub *S. flavissimo* (1871).

Tufts very yellow, somewhat powdery, about 5 mm. diam.; "ramuli of hyphæ often trifid, roughish" (Sacc. *l. c.*); conidia numerous, globose, yellow, 5–6 μ diam. (9–10 Sacc.), muriculate.

On dog's dung, from Hereford, Dec. Distinguished from the other yellow species by its globular conidia, which have a wavy or knobby outline in optical section, arising from the bluntly convex elevations by which the surface is ornamented.

109. **Gliocladium lignicolum,** sp. (?) n.—G. hyphis gregariis v. fasciculatis, erectis, æqualibus, 3–4-septatis, hyalinis, apice penicillatim di-trichotomis; capitulo conidiorum globoso v. obovato, albo; conidiis muco conglutinatis, hyalinis, oblongo-ovoideis, 2–2$\frac{1}{2}$ μ × 1$\frac{1}{2}$ μ.

In ligni superficie, "Barnt Green" (Ws.), Aug.—Sept. A *G. penicillioide* Cord. non nisi conidiis duplo brevioribus et loco natali differt; forsan potius varietas habendum. Bis repertum; semel hyphæ ligni succo parte inferiori, quinetiam ramulis, colore brunneo tinctæ sunt.

110. *Ramularia calcea* Ces. in Kl. Herb. Myc. 1681, *sec.* Sacc. *in* Mich. i. 266.—*Fusisporium calceum* Desm.

Spots oval or roundish, chalky-white, surrounded by a narrow fuscous border, 1–6 on a leaf, 3–4 mm. diam.; tufts hypophyllous, scattered or gregarious, pure white, then yellowish, consisting of somewhat branched chains of conidia, 90–100 μ high; conidia cylindrical or scarcely clavate, continuous, then uniseptate, 20–25 μ × 3 μ, hyaline.

On leaves of *Nepeta Glechoma*, Hell-hole Dingle, near Dinmore, Hereford; Oct. I have often seen the spots on the leaves before,

but they were always barren. These conidia occasionally had one end somewhat knobbed or thickened, $3\frac{1}{2}$ μ broad. Hyphæ narrower than the conidia, about as long.

111. *Dactylella ellipsospora* mihi. — *Menispora ellipsospora* Preuss, St. Deutsch. Fl. xxx. 93, t. 47 (1851).

Candidissima; hyphis tenuiter effusis, filiformibus, erectis, non v. pauciseptatis, 100-200 $\mu \times 4$ μ, interdum brevioribus, conidia singula gerentibus; conidiis ellipticis v. subpyriformibus, v. basi v. apice v. utrobique subattenuatis, utrinque duobus septis tenuissimis instructis granulosisque, medio hyalinis et gutta magna præditis, 40–50 $\mu \times$ 16–18 μ, languescentibus de apice stipitis ut in icone Preussiana declivibus. (Tab. 266, fig. 9).

In ligno putrido, "Barnt Green Reservoir" (Ws.), Aug. Semel conidia bina in apice stipitis vidi. Septa conidiorum mediocriter auctorum non visibilia; hæc tum ut in icone depicta citata videntur. Siquis tamen in dubio hærebit, conidia eo modo quo ego pinxi germinantia aspiciat.

112. *Dactylella minuta* Grove, Journ. Bot. xxii. 199 (1884).—Var. *fusiformis* mihi.

A typo non nisi conidiis fusiformibus angustioribus, et hyphis magis gregariis differt. (Tab. 266, fig. 10).

In caule *Cardui* emortuo, prope "Sutton Coldfield" (Wk.), Oct. Conidia exacte fusoidea v. apice perparum obtusiora, 60–75 μ $\times$ 7–9 μ. Septa 9–12. Hyphæ etiam confertæ v. cæspitosæ.

113. *Echinobotryum læve* Sacc. Mich. i. 82; Fung. Ital. 39 (1877).

"Loosely gregarious, black; hyphæ short, simple or very shortly branched, sparsely septate, hyaline; conidia loosely capitate-racemose towards the tip of the hyphæ, ovate or subfusoid, 12 $\mu \times$ 6–7 μ, attenuate and subapiculate at apex, subtruncate at base, with a very short hyaline stalk, smooth, dingy, paler upwards" (Sacc. *l. c.*).

On paper, dung, &c., from Hereford, and at Birmingham, Nov., Dec., May. Specimens agreed exactly with the description, in regard to the spores, but the hyaline hyphæ belonged, I fear, to a fungus upon which the *Echinobotryum* was parasitic. I do not think that *E. læve* is distinct from *E. atrum* Ca., being in fact merely "*status junior*."

114. *Bactrodesmium caulincola* Grove.—*Sporidesmium caulincola* Cord. St. Deutsch. Fl. vii. 43, t. 19 (1829); Fr. S. Myc. iii. 495 (1832); Rab. Krypt. Fl. p. 31 (1844).—Var *pellucidum* mihi.

B. effusum, atrum; conidiis sessilibus, dense compactis, cylindricis, utrinque vix attenuatis v. etiam obtusis, 6–12-septatis, dilute olivaceis, pellucidis, 60–100 $\mu \times$ 8–10 μ. (Tab. 267, fig. 1).

In caule subherbaceo ignoto, "Sutton Coldfield" (Wk.), Feb. Specimina mea quam Cordæ longiora, obtusiora, pluribus septis prædita, nec opaca. *Hymenopodio sarcopodioidi* Cord. simillimum, at stromate destitutum.

**Tetraploa aristata* B. & Br. Ann. N. H. (1850); Cke. Handb. p. 487; Sacc. Fung. Ven. Nov. v. 193 (1876); Fung. Ital. 967 (1881); Trail, Scot. Nat. p. 189 (1885).

I have met with this rare fungus once between Little Sutton and Blake Street (Wk.), Oct. The compound conidia measured 30 μ × 15 μ; the setæ, when full grown, 40 μ × 4 μ. They were found singly, and on oak-leaves, not on leaves of grass as by previous observers.

115. *Coniothecium Chomatosporum* Cord. Ic. i. 2, t. i. f. 22 (1837). —Var. *variegatum* Preuss, St. Deutsch. Fl. xxix. 59, t. 30 (1851).

"Erumpent; heaps of conidia gregarious, pulvinate, black; conidia roundish-angular, flat, brown, not darker within" (Pr. *l. c.*).

On wood, Barnt Green Reservoir (Ws.), Aug. Differs from Corda's figure only in not being darker in the centre, and agrees exactly with that of Preuss. I do not regard this, however, as being dictyosporous, but as amerosporous.

116. **Stachybotrys dichroa,** sp. n.—S. hyphis sparsis, erectis, simplicibus, hyalinis, septatis v. nonnihil articulatis (septis 3–8), flexuosis, 150–200 μ × 6–10 μ, sursum subattenuatis, basi subbulbillosis, apice coronam e ramulis brevibus hyalinis simplicibus, 12–15 μ × 3–4 μ, 5–6 verticillatis compactum gerentibus; conidiis atro-olivaceis, oblongis, 1-septatis, 10 μ × 5 μ, apice obtusis, basi oblique subattenuatis, muco tenui obvolutis et in capitula ætate magnitudine variantia atra nitida sphærica congestis. (Tab. 267, fig. 3).

In caule *Cardui palustris* putrescente, "Little Sutton" (Wk.), Oct. Cellularum lumina, rotunda, pro ratione minima, parietibus crassis olivaceis juxta posita, cærulea emicant.

TRICHOSPORIUM Sacc. Mich. ii. 25 (1880).

Hyphæ creeping, irregularly branched, dark brown. Conidia globose or ovoid, smooth, acrogenous on the branchlets. It is *Sporotrichum* with dark-coloured hyphæ and spores.

117. *Trichosporium murinum* Sacc. Fung. Ital. 740 (1881). — *Sporotrichum murinum* Link, Sp. Pl. i. 8 (1824); Bon. Handb. p. 102, f. 145 (1851); Sacc. Fung. Ven. v. 102 (1876).

Effused, mouse-coloured; hyphæ creeping, then erect, much branched upwards, clear brown, pallid and almost hyaline at apex, septate, 4 μ diam.; conidia acrogenous, ovoid or oval, pellucid, pallid, then brownish, 8–10 μ × 4–5 μ.

On dead wood, Steeton, Yorks.; Nov. (*H. T. Soppitt*). I consider these specimens to belong to this species, because of their agreement with Saccardo's figure. But if so, Bonorden must be wrong in referring to *Botrytis murina* Link and Ditmar, which is quite different.

CATENULARIA, gen. nov.

Hyphæ erectæ, fuscæ, septatæ, apice conidia concatenata gerentes. Conidia simplicia, fusca.

118. **Catenularia simplex,** sp. n. — C. effusa, atra; hyphis sterilibus longis, repentibus, flexuosis, æqualibus, fuscis, parce septatis, subramosis, 3–4 μ crass.; fertilibus gregariis, erectis,

nonnunquam flexis v. etiam recurvatis, at sæpius rigidis, erectis, simplicibus, 100–200 μ × 3–4 μ, fuscis, septatis, hinc illiuc inflatis v. sursum cupulatis (ad instar *Cladotrichi scyphophori*), cupulis hypha simili proliferis, obscurioribus; cupuli apicali ex interiore catenam erectam rigidam simplicem conidiorum emittente; conidiis 2–10-concatenatis, obovatis v. potius obconicis, utrinque truncatis, olivaceis, dein fuscis, 10–15 μ × 5–6 μ.

In ligno putri, "Streetly" (St.), Oct. A Cladotricho, licet maxime affinis, conidiis differt continuis essentialiter.

119. *Stachylidium extorre* Sacc. Mich. i. 84; Fung. It. 49 (1877).

Effused, fusco-cinereous, velvety; hyphæ erect, cylindrical, slightly thickened at base, gradually attenuated upwards, 50–200 μ × 4–5 μ, septate, opaque, dark brown, towards the apex verticillately branched; ramuli apical or closely subapical, paler, almost hyaline, 3–6 together, attenuated above, bulbous below, simple or rarely again branched; conidia forming spherical translucent globules, 6–10 μ diam., on the apex of the branches, at first involved in mucus, then diffluent, oblong, 3–4 μ × 1½ μ, hyaline.

On dead wood, "World's End, Harborne" (Ws.), Nov. No brown creeping threads at base; but many of the stems were beaten down by the weather, and the apex curling upwards looked like a very short stem. Occasionally the stem seemed almost non-existent, and the crown of glistening ramuli was seated directly on the wood.

120. *Helminthosporium Hirudo* Sacc. Mich. i. 85 (1877); ii. 376 (1881); Fung. Ital. 54 (1877).—Var. *Anglicum* mihi.

H. in maculas aterrimas, velutinas, oblongas v. elongatas aggregatum; hyphis subfasciculatis, brevibus, cylindricis, septatis, 25–50 μ × 6–8 μ, fuscis; conidiis fusco-fuligineis, 300–400 μ v. etiam 450 μ longis, infra lanceolatis, 15 μ crass., sursum in longissimum rostrum cylindraceum, 6–8 μ crassum attenuatis, 50–60-septatis; cellulis rostri quadratis; apice truncato, nec pallidiore.

In ligno emortuo, "Sutton Coldfield" (Wk.), Mar. Species maxima. (Tab. 267, fig. 5).

Var. *minus* mihi. — H. dense gregarium, in maculas atras effusum; conidiis lanceolatis, stipite brevi v. longiori, erecto, rigido, 3–5 septato, denique opaco suffultis, in rostrum longum cylindraceum, attenuatis, 100–200 μ long., 10–12 μ (rostro 4–5 μ) crass., atro-fuscis, semipellucidis, 30–50-septatis.

In ligno putrido, "Sutton Coldfield" (Wk.), una cum *H. obclavato* Sacc. quod certe nil nisi status junior demonstrabatur; omnes enim transitus simul sunt visi. Stipes 30–40 μ × 4–5 μ, sed interdum usque ad 90 μ longus.

121. *Helminthosporium hormiscioides* Sacc. Mich. i. 85; Fung. Ital. 55 (1877).— *Sporidesmium hormiscioides* Corda, Ic. ii. 6, fig. 26 (1838).—*Closterosporium hormiscioides* Sacc. Mich. ii. 22 (1880).

Rather scattered; conidia on very short (15–20 μ high) stems, erect, undulate, vermicular-fusoid, tapering at both ends, but most upwards, dark olive-brown, opaque, rigid, 180–190 μ × 12–20 μ; septa 28–29; apex swollen, rounded, pallid.

On oak-wood, Sutton Coldfield (Wk.). This is exactly the plant of Corda, except in being more thinly effused. The thickest part of each conidium is often nearly in the middle of its length, by which feature, the want of the cylindrical beak, the swollen apex, and the fewer septa, the species is easily distinguished from *H. Hirudo* var. *minus*. It is, in my opinion, a true *Helminthosporium*.

122. **Helminthosporium parvum,** sp. n. — H. parce gregarium, fusco-atrum; hyphis erectis, septatis, dilute fuscis, gracilibus, strictis, æqualibus, raro subfasciculatis, apice conidium unicum (rarissime bina) gerentibus, basi interdum subincrassatis, 80–90 μ × 3–4 μ; conidiis oblongis, tridymis, apice obtuse rotundatis, basi truncatis, loculo apicali subquadrato et basali cuneato luteis, centrali rotundo crassiori (inflato) brunneo, 12–15 μ × 5–6 μ.

In ligno quercino, "Sutton Coldfield" (Wk.), cum *H. hormiscioide* Sacc. Loculis apicalis subinde brunneus, basalis nunquam. *H. coryneoidi* subaffine. (Tab. 267, fig. 4).

123. **Acrothecium xylogenum,** sp. n. — A. hyphis non maculicolis, erectis, strictis v. curvulis, æqualibus, infra fuscis, sursum pallidioribus, apice fere hyalinis, 120–250 μ alt., coronam 6–8 conidiorum gerentibus; conidiis cylindricis, apice rotundatis, basi acutatis, 4-guttulatis, denique tenuiter 3-septatis, hyalinis, 14–17 μ × 3 μ. (Tab. 267, fig. 2).

In ligno putri, "Barnt Green Reservoir" (Ws.), Aug. *A. caulium* Sacc. (Mich. i. 75) affine, at conidiis semper hyalinis, 3-septatis distinctum. Septa maturitate tantum visibilia.

124. *Acrothecium obovatum* Cooke, Grevill. v. 50, t. 80, f. 13 (1876); Blk. Moulds, t. 27, f. 30 (1877); Sacc. Fung. Ital. 766 (1881); Mich. ii. 555 (1882).

Black, thinly effused; hyphæ simple, slender, erect, septate, brown, about 180–230 μ × 6 μ; conidia forming a crown at the apex of the stem, radiating horizontally or nearly so, 2–5 or even 6 together, obovate or obconical, more rarely pyriform, sometimes irregular, brown, but not opaque, biseptate, slightly constricted, the upper cell usually equalling the other two; there is often also a short hyaline basidium remaining attached to the conidia, which measure 18–21 μ × 9–10 μ.

On dead wood, Sutton (Wk.), April. The description is drawn up from my specimens, which differ from those of Cooke only in the translucent (probably less mature) conidia.

125. *Acrotherium simplex* B. & Br. Ann. N. H. t. 16, f. 16 (1861); Cooke, Handb. p. 579.—Var. *elatum* mihi.

A. hyphis simplicibus, erectis, subflexuosis, æqualibus, fuscis, sursum pallidioribus, 240–280 μ × 7 μ; conidiis 3-septatis, oblongis, subclavatis, hyalinis, 20–22 μ × 6 μ.

In caule *Urticæ dioicæ*, "Harborne" (Ws.). In typo, sec. iconem citatam, hyphæ me judice ca. 100 μ alt. viderentur, specimina vero habeo hyphis ne 50 μ quidem altis; in his conidia denique 2-3-septata, leviter fuscescentia, 13–17 μ × 5 μ.

126. *Cercospora ferruginea* Fckl. Symb. Myc. p. 354 (1869); Nachtr. ii. 20 (1873).

Tufts thin, effused; hyphæ long, creeping, loosely branched, septate, ferruginous, 5–6 μ diam.; conidia ovate, then obclavate, tapering to an obtuse point, somewhat curved, 2–5-septate (when younger continuous, guttulate, then uniseptate), pale brown, with a pellucid reddish tinge, 50 μ long.

On under side of leaves of *Artemisia vulgaris*, Bradnock's Marsh (Wk.), Oct. Not fully perfected, but clearly this species, which appears to be very rare, and was considered by its author to be the conidia of his *Sphærella ferruginea*.

127. **Helicosporium albidum,** n. sp. — H. hyphis erectis, septatis, fere hyalinis, primo simplicibus, dein infra ramosis, $2\frac{1}{2}$–3 μ crass., 200–300 μ alt., sed supra—æque ac rami longi adscendentes—sterilibus et flagelliformibus; conidiis pleurogenis, substipitatis, hyalinis, pluri-guttulatis, 2–$2\frac{1}{2}$ μ crass., basi attenuatis, apice obtuse rotundatis, in circulum 15–20 μ diam. dense spiraliter convolutis; spiris plerumque quaternis. (Tab. 267, fig. 6).

In ramis tenuibus *Rubi fruticosi*, "Middleton" (Wk.), Apr. Non pro certissimo habeo, hunc non esse statum abnormalem, sed cui speciei subjungam dijudicare nescio. Maculas efformat albidas velutinas.

128. *Helicosporium lumbricoides* Sacc. Mich. i. 86; Fung. Ital. 56 (1877).

Effused, forming whitish-grey spots; hyphæ creeping, filiform, branching and anastomosing, 4–5 μ diam., remotely septate, pale olive-brown, with short hyaline teeth; conidia vermicular, loosely wound in 2–$3\frac{1}{2}$ spires, 150 $\mu \times 4$ μ, with many guttulæ in one row, hyaline.

On rotting oak, Sutton, Sept. This was detected several years ago by Mr. W. Phillips on a fragment of wood which I sent to him, but I was unable to meet with it again till last September. The conidia are remarkable as being loosely convolute, forming, when examined in water, the most fantastic knots, like those of a wriggling worm.

DACTYLOSPORIUM Harz (1871).

Hyphæ erect, simple, septate, brown. Conidia cellular, ovoid, acrogenous, capitate, brown.

Genus formed by Harz, Neue Hyph. p. 44, to contain *Mystrosporium macropus* Cord. Ic. iii. f. 27.

129. **Dactylosporium brevipes,** sp. n.—D. gregarium atrum; hyphis erectis, brevibus, flexuosis, fuscis, sursum pallidioribus, dense septatis, subtorulosis (cellulis subquadratis), simplicibus v. raro apicem versus furcatis, 50–70 $\mu \times 5$ μ; apice capitulum atrum compactum 5–8 conidiorum gerentibus; conidiis obovatis, saturate fuscis, fere opacis, 20–22 $\mu \times 10$–13 μ, angulate cellulosis, septo unico longitudinali percurrente, reliquis obliquis v. radiantibus. (Tab. 267, fig. 7).

In ligno *Aceris pseudo-platani*, "Sutton Coldfield" (Wk.), Feb. *D. macropodi* Harz peraffine et quasi varietas, at satis diversum videtur.

STEMPHYLIUM Wallr. (1833), emend.

Hyphæ decumbent, branched, intricate, frequently hyaline, sometimes brownish. Conidia ovoid, cellular, fuscous, acrogenous. *Sacc.* Mich. ii. 31, 291.

In this genus Saccardo includes *Soredospora* Corda and *Epochnium macrosporoideum* Berk. (Cke. Hndb. p. 623); also *Sporidesmium pyriforme* Cord. and *S. alternaria* Cke. Hndb. p. 483. He identified the latter with *Stemphylium botryosum* Wallr. Crypt. Fl. p. 300 (1833), which again is identified by Harz with *Ulocladium botrytis* Preuss, St. Deutsch. Fl. t. 42 (1851): but in the Syll. Fung. iv., just received, I see that Saccardo has again separated them.

130. *Stemphylium* (?) *Magnusianum* Sacc. Mich. i. 132 (1878); Fung. Ital. 934 (1881).

Conidia nearly globular, large, 30–60 μ, shining pinkish-ochre or of a pleasant reddish colour, composed of numerous globular pellucid cells densely compacted together, seated on a loosely felted mycelium of nearly hyaline hyphæ, and forming extensive pink or reddish patches.

On rotting paper, dung, &c., Birmingham, Nov. The mycelium was attacked abundantly by *Echinobotryum atrum* Ca. and *E. læve* Sacc. I can add nothing to Saccardo's description of this fungus; though it may be a *Stemphylium*, I am inclined to think that it is only an imperfectly developed stage of a Eurotiaceous fungus.

131. *Isaria sulphurea* Fiedler; Sacc. Mich. ii. 367; Fung. Ital. 845 (1881).

Stems gregarious, erect, elegantly clavate, pale sulphur-coloured. whitish below, 1·5 mm. high, composed of dense intricate flocci, which are septate, and here and there swollen. Conidia acrogenous, or lateral on short ramuli, subglobular, slightly darker than the pale yellow flocci, 5–6 μ diam.

On dog's dung, from Hereford, Nov., Dec. Saccardo remarks that this may be the *Coremium citrinum* of Persoon. The flocci of my specimens did not anastomose so much as in Saccardo's drawing, and they were swollen at intervals, the swelling being very similar to a conidium.

132. *Graphium penicillioides* Cord. Ic. i. 18, f. 251 (1837); Rab. Krypt. Fl. 120 (1844); Sacc. Mich. i. 77; Fung. Ital. 16 (1877).

Stems scattered, black, short, 100–130 μ high, thick, obtusely clavate above, sometimes swollen below, composed of fasciculate fuscous hyphæ, paler upwards; conidia acrogenous, linear, hyaline, 4–5 $\mu \times 1\frac{1}{4}$ μ, forming a whitish head.

On bark of sycamore, Sutton Coldfield (Wk.), Dec. When dry the whole fungus shrivels up somewhat, and the head of spores becomes dispersed. It was in company with *Collonema papillatum*.

DENDRODOCHIUM Bon. (1851).

Tuberculariod. Receptacle wart-like, varying. Conidia ovoid or oblong, acrogenous on densely compacted branched subverticillate basidia. *Bon.* Handb. p. 135 ; *Sacc.* Mich. ii. 34.

133. **Dendrodochium citrinum,** sp. n. — D. sporodochio verruciformi, ½ mm. diam., circulari, valde convexo, distincte marginato ; disco nitente, citrino, extus limboque tumido saturatioribus ; basidiis repetite 2–5-verticillato-ramosis ; ramulis filiformibus ; conidiis acrogenis, lævibus, sphæricis, luteolis, guttulatis, 1·75 μ diam. (Tab. 267, fig. 8).

In ligno putrido *Pini sylvestris*, "Barnt Green" (Ws.), Sept.

NOTES ON SOMERSET RUBI.

By the Rev. R. P. Murray, M.A., F.L.S.

While collecting materials for my projected Flora of Somerset I devoted special attention during part of the year 1883 to the brambles of the county. During some portion of the time I enjoyed the benefit of Mr. T. R. Archer Briggs's assistance. He accompanied me in many of my excursions, and helped me by every means in his power. Alone, or with Mr. Briggs, I have, as I think, examined the county sufficiently to gain a very fair idea of the distribution of bramble forms within the area, and I venture to submit the results for publication, in the hope that they may prove interesting to students of this prickly genus. I have little or no acquaintance with the brambles of the extreme north of the county (Bath and Bristol districts) in a living state, but have been most liberally supplied with notes and specimens by Mr. J. W. White, of Clifton. My thanks are also due to Prof. Babington, Mr. J. G. Baker, Mr. D. Fry, and Rev. W. Moyle Rogers, for kind assistance in collecting or determining specimens.

On the whole, the bramble-flora of Somerset may be considered fairly rich ; but it is only particular districts which are well supplied. Large portions of the county can only be described as totally uninteresting, so far as brambles are concerned. The long ridge of Polden, with the valleys which lie on either side of it, I have found especially barren. On the other hand, the country about Dulverton, Dunster, and Porlock, in the extreme west, is rich both in forms and in individuals. The slopes of the Blackdown Hills above Wellington abound in interesting forms. Quantock is interesting ground, and deserves further study. The Yeovil district is poor (this applies to the flora generally, and not to the brambles only). The eastern slopes of Mendip, from Cranmore to Frome and Witham, present a considerable variety of forms, while the country about Pen Selwood and Castle Orchard in the extreme south-east will afford the batologist ample opportunities for study.

Rubus Idæus L. — Frequent throughout the county. In some districts one of the most abundant plants (Downhead; Quantock), sometimes covering acres. With pale fruit on Glastonbury Moor (*T. Clark*).

Var. *Leesii*.—I fear this may be lost at Bonniton, near Dunster, where it was found by the Rev. W. H. Coleman in 1849. I have repeatedly searched for it in vain.

R. suberectus Anders. — Very local. The scarcity of the whole suberect group in Somerset is very remarkable. True *suberectus* seems quite confined to the west of the county. It is common in the damp wooded valleys about Dulverton and Dunster. A plant collected by Dr. Parsons near Witham, on the eastern border, may be this, or *R. plicatus*, but the specimen is too imperfect for determination.

R. fissus Lindl. — I have very seldom met with this form in Somerset. Once, on the ridge of the Blackdown Hills above Wellington. This was called *suberectus* by Mr. Briggs, but is clearly separable from the usual form of the type by the much more prickly stem and thicker leaves. The terminal leaflet, however, is ovate-attenuate, as in *suberectus*. And once, on Quantock, a plant (in very young inflorescence), placed here doubtfully by Briggs. To my eye this looks somewhat nearer *suberectus* than the Blackdown plant, but I am convinced that no clear line of demarcation can be drawn between the suberect forms.

R. plicatus W. & N. — This is the characteristic bramble of the peat-moor below Glastonbury, where it is very abundant. Yet, so far as I know, it occurs nowhere else in the county. The name has been confirmed both by Babington and Briggs. The plant varies considerably. One specimen, collected on the railway-bank near Edington Road Station, has all the leaflets (of the barren stem) extremely broad in proportion to their length, with the basal leaflets strongly imbricate. The inflorescence is quite that of *plicatus*.

R. affinis W. & N.—Dulverton; Oare Valley; Quantock Hills; Castle Orchard, near Pen Selwood. Certainly rare in Somerset, and, like its allies, decidedly western in its distribution. The Castle Orchard plant was referred to *fissus* by Briggs, but seems better here; it affords an outlying station in the extreme south-east of the county. The Quantock plant decidedly approaches *plicatus*. Mr. Green's record of *affinis* from Winscombe (Mendip) requires confirmation. Mr. Baker, in his recent paper (Journ. Bot. 1886, p. 6), seems to throw some doubt on the correctness of the name *affinis* as applied to our English plant. It is to be noted, however, that Mr. Briggs remarks ('Flora of Plymouth,' p. 111) that "Dr. Focke considered specimens that I sent him of the plants at Riverford and Buckland Monachorum Down as representing quite typical *affinis*, exactly the same as that common in the hedges near Minden." But is the *affinis* of the West of England the same as the *affinis* of the North? Possibly not: and I imagine Mr. Baker to be familiar with the northern plant rather than with the western; and I have very lately seen in Mr. Moyle Rogers's herbarium a

bramble considered by Baker to be good *affinis*, which is certainly what we in the west have been calling *calvatus*.

R. Lindleianus Lees. — Yeovil; Castle Orchard; Downhead Common; Witham; Shipham; Failand, near Bristol, in which district Mr. White tells me the plant is not uncommon, and that he has not met with gradations; "Boniton Wood, W. Som. (*T. B. Flower*)," 'Brit. Rubi.' This comprises all the information I possess as to the distribution of typical *Lindleianus* in Somerset; but I have collected in many parts of the county a plant which I had always considered as this species until Mr. Briggs separated them and asserted their identity with the form referred to in his 'Flora of Plymouth' as abundant in that neighbourhood, and probably a new species, though allied to *Lindleianus*. This plant is very common (and very variable) in the west of the county, as about Dulverton and Dunster. Same specimens (as one from Minehead) closely approach typical *Lindleianus;* but on the whole there is a tendency to a reduced and simpler panicle, while in several instances the leaves of the barren stem are ternate. In the case of one plant placed here by Briggs the leaves are quinate-pedate, and strongly imbricate. My impression is that the gradations between the extreme type of this form (which approaches *rhamnifolius*) and ordinary *Lindleianus* are too numerous, and shade too gradually one into another, to make it desirable that it should be erected into a new subspecies. I have noted it also from a hedge near Taunton; hedges near Broomfield; very abundant about Plainsfield; near Wellington; hedge between Yeovil and W. Coker; Clevedon; near Stoke Lane. I have collected the same form at Groombridge, in Sussex; and Mr. White finds it close to Bristol, in West Gloucestershire.

R. rhamnifolius W. & N. — Generally common, except in the Polden district, where I have not seen it.

R. imbricatus Hort. — Extremely rare in Somerset. I know of only one station, *viz.*, in a hedge near Spaxton, near the eastern slopes of Quantock, where it was detected by Mr. Briggs in 1883. It exactly resembles Plymouth specimens.

R. discolor W. & N. — Common almost everywhere; generally quite typical, but sometimes a form approaching *leucostachys*. I have seen this about Wellington, and in other places. It has occurred near Wells (*R. J. Manning*) and Axbridge (*J. W. White*) with white fruit (var. *leucocarpus*).

R. thyrsoideus Wimm. — Rare, and apparently confined to the north-west of the county. "Hill-side between Cheddar and Axbridge" (*J. G. Baker*). Briggs places here with some doubt a plant which we gathered in a coppice above Congresbury. "Hedges at Ken; and a hedge in Walton-by-Clevedon, beyond Lady's Bay" (*W. E. Green*). Mr. White informs me that Mr. Green's specimens seemed to be excellent.

R. leucostachys Sm. — An abundant woodland species, occurring even on Polden. Generally easy to recognise.

R. calvatus Blox.— Fairly common in the west and south of the county. I have it from St. Audries and Buncombe Hill, in the

Quantock district, the latter "exactly Bloxam's plant" (*T. R. A. Briggs*); from the Blackdown Hills; Barwick, near Yeovil; Penpits; Downhead Common; and Witham. Mr. Baker records it from the "Lime-kiln, Wookey Hole, and hill-side above Ebbor Rocks." I have searched the neighbourhood of the lime-kiln for this plant, in company with Mr. Briggs, but cannot now find it.

R. villicaulis W. & N. — A frequent bramble in Somerset. Occasionally, as near Oare, with leaves beautifully laciniate. "Dunster" (*T. B. Flower* in 'Brit. Rubi'); frequent about Minehead; Quantock; Pen Selwood; Bishop's Wood; Wells, "a form approaching *adscitus*" (*Briggs*); Downhead Common; Shipham; "Clevedon," *J. W. White*, who writes to me that he has received the typical plant from Mr. Green, but can himself only find there a form varying in the direction of *leucostachys*, i. e., with the leaves much more hairy beneath. He finds the same form in Gloucestershire, and Briggs near Plymouth. "Briggs considered this form to be nearer *leucostachys;* Babington named it *villicaulis* without comment."

β. adscitus Genev. — Probably rare in Somerset. I have only twice found it in the county, *viz.*, in a hedge near Dulverton, and close to the Wellington Monument. Just the plant of the 'Flora of Plymouth.'

R. umbrosus Arrh. — Locally common, extending from Culbone in the west to Pen Selwood in the south-east. About Wells, and thence eastwards to Witham; Clevedon. Mr. White finds it "plentiful in open woods near Bourton and Brockley, generally occurring in large masses."

R. macrophyllus Weihe. — Scarce and local. Culbone (*C. C. B.* in 'Brit. Rubi'). Not unfrequent about Dunster, one of my specimens being marked "typical" by Baker. "For about half a square mile between Abbot's Leigh and Lower Failand, a very remarkable and distinct plant" (*J. W. White*).

Var. *amplificatus* Lees.—"Hill-side above Wookey Hole" (*Baker*).

The locality (for var. *Schlechtendalii*) near Midford Ponds, Bath, given in the supplement to 'Flora Bathoniensis,' is now doubted by Prof. Babington, as he has no specimen in his herbarium from this station.

R. mucronulatus Bor. — Very local in Somerset. Frequent and very fine in the hedges above Kingston, in the Quantock district, and I have it from the neighbourhood of the Wellington Monument. These plants I should consider good *mucronulatus*. A bramble which occurs in two or three places near Clevedon must, I think, certainly be placed here; it differs from the Quantock plant in the longer axillary branches of the panicle, which is also somewhat less leafy. In none of my Somerset specimens do I find any setæ on the barren stem, and the sepals seem shorter and less pointed than they are described in 'Bab. Man.'

R. Sprengelii Weihe, *α. Borreri.* — Apparently a very rare bramble in Somerset. I have it with certainty only from Norton's Lane, near Clevedon; but it is possible that a bramble from Castle Orchard, near Pen Selwood, may belong here. It is curiously like

affinis in general appearance, but the presence of setæ on the stems are fatal to this determination. In reality it seems to come nearer to *Borreri* than to anything else. Another plant, which is frequent in hedges near Downhead Common, on the way to Stoke Lane, must also, I think, be referred here, at least for the present; it is exceedingly unlike the Clevedon plant, but resembles in many respects the *R. Borreri* of the neighbourhood of Plymouth; it deserves further investigation.

R. Bloxamii Lees. — Few plants have given me more trouble than this. I fear I have yet much to learn about it. At present it seems to me that at least two distinct forms are comprehended under it. One of these occurs somewhat frequently on hilly ground in the south of the county; between Kingston and Broomfield, on Quantock; near the Wellington Monument; and about Castle Neroche. This form is characterised by a very leafy panicle (especially the Quantock plant), and a tendency to a corymbose arrangement of the axillary branches of the panicle. It agrees fairly well with Babington's description of *Bloxamii*, but I have had no opportunity of comparing it with authentic specimens. Mr. Briggs referred the Quantock and Wellington plants to *Bloxamii* with some doubt. They are certainly very different from the Plymouth plant bearing the same name, which Babington seems (formerly, at least) to have identified with *R. rhenanus* Müll. More recently he has applied the name *rhenanus* to a plant from Leigh Woods, near Bristol, which seems to me quite different. I possess but a single specimen of this plant, which I owe to the kindness of Mr. White, who has given me an interesting account of its adventures in search of a name. It appears that it was first named *Bloxamii* by Baker, after a hurried inspection. A year or two later he examined it again more carefully, and this time placed it under *pallidus* of the 'Student's Flora,' but did not consider it to be *pallidus* of Weihe. Dr. Lees avers it to be his "idea of a *scaber* form." Finally Babington: "Is apparently *R. rhenanus* Müll. . . . . *Rhenanus* is much more hairy, and the panicles different." Mr. White calls attention to the "very peculiar bloom upon the barren stem." He describes the plant as "a strong well-grown bramble, easily recognised, which grows in some quantity in open spaces near the Suspension Bridge." I can add little to this: only, if *this* is *rhenanus*, then the Plymouth plant is not, and *vice versâ*. This is clearly shown by the fact that Mr. Briggs has declined to suggest any name for the bramble in question, though of course well acquainted with the plant of his own district. Further: *R. scaber* is recorded in 'Brit. Rubi' as a plant of Leigh Woods, where it was found by Mr. T. B. Flower; but since then no one seems to have met with the plant there—unless it be the subject of the present note. I am inclined to think this may be the solution of the difficulty, but only offer the suggestion for what it may be worth.

R. Hystrix Weihe. — This is a local bramble in Somerset, and (if typical *Hystrix* be alone taken into consideration) is decidedly rare. I have it from a "lane near Wellington"; from Bishop's

Wood, Wells; Stoke Lane (here springing from a stone wall in quite open country); and from edges of woods near Witham. But if *R. rosaceus* Weihe be included, as I think it should be, the distribution becomes more extended. *R. rosaceus* is rather common near Dulverton, and occurs also about Luxborough, and on the Blackdown Hills, near the Wellington Monument. These plants were all named *rosaceus* by Baker; Briggs would call them *Hystrix* now, though in the field he was inclined to call the Wellington plant *rosaceus*. So far as I can myself judge, I should agree with Mr. Baker, yet holding that the two forms are hardly separable. Mr. Baker has also named a plant found by Mr. D. Fry at Worle Hill, near Weston-super-Mare, *rosaceus;* and Prof. Babington one from Congresbury.

R. scaber Weihe.—Leigh Woods (*T. B. Flower* in 'Brit. Rubi'); **but see remarks under *R. Bloxamii*.**

R. rudis Weihe.—Another local bramble; generally well-marked and typical. I have it from Kingston, Broomfield, and Wellington, in the south-west; from Clevedon, and from Downhead Common. Mr. White tells me it is plentiful about Abbot's Leigh. Leigh Woods ('Brit. Rubi'). I understand that Dr. Focke has seen a specimen from Clevedon, and has named it *R. echinatus* Lindl.

R. Radula Weihe.—This seems to be decidedly a scarce bramble in Somerset. I have it from Chipstable, in the west; from Clevedon, and from Downhead Common; and have a note that I saw it in the Bishop's Wood, Wells. Mr. White sends it to me from the edge of Leigh Wood, with the remark that it is apparently rare in North Somerset. Mr. Baker notes it from Ebbor Rocks, near Wells, but searched for it in vain in the Polden district.

R. Koehleri Weihe. — This is one of the commoner Somerset brambles, occuring in most parts of the county. I have found myself quite unable to distinguish satisfactorily between the various forms usually grouped together under this name, and fear that the following assignment of localities may be somewhat rash. Practically, I have called *Koehleri* those plants which have the under surface of the leaves almost naked, while I have assigned those with more or less felted leaves to *pallidus*. I do not understand *infestus*. *R. Koehleri*:—Dulverton ("typical," *J. G. Baker*); Heydon Down; in many places on Quantock; Castle Orchard; Leigh Wood (this last received from Mr. White, and certified both by Babington and Baker).

R. pallidus Weihe.—Dulverton; Culbone, and thence eastwards to Dunster; Clevedon; Shipham; Downhead; "Leigh Woods" (*Bab.* in 'Brit. Rubi'). But none that I have seen seem to me quite to agree with *pallidus* as it occurs in the North of England.

R. fusco-ater Weihe. — I can say little about this, as I do not understand the plant. I have never seen a specimen so named which appeared to me to answer to the descriptions in books. But a plant from Quantock, "above Broomfield," seems to approach more closely to some of the Plymouth plants grouped by Briggs under this name than to any other. I believe also that this was the opinion of Mr. Briggs, who was with me when it was collected.

R. diversifolius Lindl. — This is not an uncommon form in Somerset, but I have not noticed it at any spot further west than the Wellington Monument. It occurs about Yeovil (*Briggs*); but I understand that Baker has named plants from this locality *tuberculatus* for the Rev. J. Sowerby. Mr. Briggs thought some of the bushes might quite well be so named, which may be the case if they are correct who would unite these forms under the name of *dumetorum*. Bishop's Wood, Wells; Cheddar (*Baker*); Ebbor Rocks Wood, a curious variety with very long leafy panicle (*Baker*). I have collected this form myself in the same locality. Congresbury; Worle Hill; near Clevedon; hedges near Cranmore and Witham.

[*R. Lejeunii* auct. Angl. — Very rare. Road-side near the Wellington Monument. A plant with ternate leaves is plentiful in the adjoining woods. It is probably a form of this species altered by growing in shade. Probably not *Lejeunii* Weihe].

R. pyramidalis Weihe.—This very beautiful bramble is frequent in the west of the county, but does not (I believe) extend further eastwards than Wellington. Culbone Woods (*Bab.* in 'Brit. Rubi'). It is plentiful in this locality. Porlock Weir; Bonniton, near Dunster; near the Wellington Monument.

R. Guntheri Weihe.—I know of but one station for this plant in Somerset, *viz.*, below the Wellington Monument. This place seems to be a natural botanic garden for Rubi; I know of no other place where so many forms may be collected in so small an area. *R. Guntheri*, as it occurs here, is excessively luxuriant, and forms a very beautiful plant. The leaves are not felted beneath. In this particular it agrees with a Plymouth specimen in my herbarium, for which I am indebted to Mr. Briggs.

R. humifusus Weihe. — Edford Wood. Exactly resembles a plant from Kenilworth, named *humifusus* by Prof. Babington, for which I am indebted to Mr. Bagnall. I also place here with much confidence a bramble which is very abundant in some woods near Witham, and at Blackslough. My specimens from these stations have mostly ternate leaves. "Woods, Berkeley" (*Dr. H. F. Parsons* in 'Record Club Report for 1883,' which adds, "This looks to me just ordinary *pallidus* (*J. G. Baker*). . . . . I think probably correct—it is not so robust as ordinary northern *pallidus*, has slenderer prickles, more hairs on the rounder stem, and quinate-pedate leaves to barren stem. It, too, has leaves prolonged into the panicle, the character given by Hooker's 'Student's Flora,' 3, where it is placed as a variety of *pallidus*." The only specimen I have seen is very immature, but I do not believe it has anything to do with *humifusus*.

R. glandulosus Bell, β. *hirtus*. — Apparently rare in Somerset. Castle Orchard; Downhead Common. Possibly these plants might be better placed under var. γ. *Reuteri*, but I have never seen authentic examples of this plant. Mr. Baker has recorded *R. hirtus* W. & K. from Butleigh Woods (Polden).

R. Balfourianus Blox. — Not a common bramble in Somerset; at least, I have very seldom met with it. Wood at Butleigh

Wootton. My specimen from this station has been submitted to Prof. Babington, who, after comparison with specimens in Herb. Genévier, gave me the following synonyms:—*tenuiarmatus* Lees; *rivalis* Genév. "Whitchurch (*Rev. W. H. Painter, fide Rev. W. H. Purchas*)" ('Flora of the Bristol Coal-field'). "By the canal at Claverton," near Bath (*Bab.* in 'Brit. Rubi'). Mr. Baker finds the "var. *degener*, a form differing from *corylifolius* mainly by its ascending sepals, not uncommon" about Somerton.

R. corylifolius Sm.—Generally common throughout the county. Noted at Dunster, Quantock, Taunton, Wellington, Yeovil, Somerton, Pen Selwood, Mendip, and Witham; in these cases var. *α. sublustris*. In some other cases, as about Bridgwater and Norton, I have only noted the aggregate. Mr. White records "*corylifolius*" from Ken, Clevedon, and Leigh Wood. Prof. Babington records var. *γ. purpureus* from Bath in 'Brit. Rubi.'

R. althæifolius Host.—Kewstoke (*Bab.* in 'Brit. Rubi').

R. tuberculatus Bab.—Hedges at Compton (Polden), *Baker*. A very remarkable bramble occurs in abundance about Burnham and Berrow, which I believe belongs here. Mr. Moyle Rogers finds what we consider to be essentially the same thing on the "border of Warleigh Common," near Bath, "in good quantity." Concerning this Warleigh plant Mr. Bagnall writes, "Would not this come under *R. dumetorum*, var. *tuberculatus* of Warren? It is evidently one of the *dumetorum* group."

R. cæsius L. — Common and generally distributed throughout the county, perhaps less so in the extreme west. The record of var. *pseudo-idæus* in the 'Flora of the Bristol Coal-field' is an error.

R. saxatilis L.— Very rare. I found this interesting species for the first time in Somerset in May, 1883. It grows finely, and in some plenty, in one part of Asham Woods, a few miles south of Frome; possibly also in other parts of the same extensive woods.

NOTES ON THE FLORA OF ST. KILDA.

By R. M. Barrington, M.A., F.L.S.

The following is a list of plants noticed on the Island of St. Kilda in the year 1883, where I landed on June 9th, and staid about three weeks. The St. Kilda group consists of six or seven islands and rocks. On four of these vegetation exists, namely, Borrera, Soa, the Doon, and St. Kilda proper. I visited all, but found no species on any of the group which did not also occur on St. Kilda. The highest point is about 1220 ft.; there is no Ordnance map. The flora of this distant island, situated between fifty and sixty miles west of the Hebrides, has a special interest and I can find no record of its vegetation, except the very meagre list of twenty-nine species mentioned by Macgillivray ('Edin. Phil. Journal,' 1842, p. 47); and it is remarkable that in this list there are at least eleven species not observed by me:—*Aira cristata*,

Avena flavescens, *Habenaria viridis*, *Gentiana campestris*, *Erythræa centaurium* var. *latifolium*, *Cakile maritima*, *Arenaria peploides*, *Salsola Kali*, *Avena strigosa*, *Cochlearia danica*, and *Ligusticum Scoticum*. I was too early for botanising, but this excuse is insufficient.

Macgillivray's list is evidently not intended to be complete, but his omission of some of the species contained in the following catalogue of about 120 species is unaccountable. It is possible I may yet have to add a few species when a more careful examination of my herbarium is made. Though a long interval has elapsed since my visit, this paper has been written with less leisure than I should wish. To Mr. A. Bennett, of Croydon, my thanks are specially due for friendly aid.

Species not in Babington's 'Flora of the Outer Hebrides' are marked *. Those in Macgillivray's list are distinguished by the prefix, "M."

Ranunculus Flammula L. Common.
R. acris L. Very common. — Var., perhaps v. *pumilus* Wahl.?
R. repens L. Not common; introduced? — f. *alpina* Rostrup (Fl. Faroes). On cliffs.
**R. Ficaria* L. One of the commonest plants.
M. *Cochlearia officinalis* L. Frequent; very large in places.— *Var. *alpina*. On hills.
Capsella Bursa-pastoris Moench. Near houses.
Viola sylvatica Fries, var. *Riviniana*. Common, and generally with a single flower.
**Polygala depressa* Wender. Flowers pink and white, but most commonly blue; forms come near *vulgaris*.
M. *Silene maritima* With. Abundant on cliffs; sparingly on hills over sea.
S. acaulis L. Very rare; only in two places on St. Kilda, the end near the Doon.
Lychnis Flos-cuculi L. Frequent.
Cerastrum tetrandrum Curt. Common.
C. triviale Link. Common; a large-flowered form, var. *alpestre*, with flowers often solitary, occurs on summits of hills.
Stellaria media With. Common.
Sagina procumbens L. Common.
S. subulata Wimm. Rare; on end of St. Kilda near the Doon.
Spergula arvensis L. In cultivated ground.
Montia fontana L. Common.— Var. *rivularis*. Frequent.
Hypericum pulchrum L. Rare; in one spot in the gully on Conacher.
Trifolium repens L. Common.
Vicia sepium L. Rare; on the cliffs near Soa, and on the Island of Soa; not over 6 in. high anywhere.
Potentilla Tormentilla Neck. Common.
P. Anserina L. Near houses.
Callitriche vernalis Koch.
M. *Sedum anglicum* Huds.? Believed to have been seen.
M. *S. Rhodiola* DC. Called by the natives "Usanion"; plentiful and luxuriant on cliffs.
**Saxifraga oppositifolia* L. Only in the gully on Conacher, behind the village.
Hydrocotyle vulgaris L. Plentiful.
Angelica sylvestris L. Plentiful on cliffs in many places.
Lonicera Periclymenum L. In one spot only to the east of landing places, on cliff.
Galium saxatile L. Common.
Scabiosa Succisa L. Everywhere.

Carduus lanceolatus L. Near village.
M. *Chrysanthemum segetum* L. The principal weed in tke oats.
M. *Matricaria inodora* L., var. *salina*. On the cliffs.
Achillea Millefolium L. Common.
Gnaphalium dioicum L. Common.
Senecio Jacobæa L. Frequent.
S. aquaticus Huds. Frequent.
Leontodon autumnalis L. Very common.
M. *Taraxacum officinale* L., var. *palustre*. Common; growing in the wildest and most exposed situations.
Sonchus asper Hoffm.? Too young to distinguish from *oleraceus*.
Vaccinium Myrtillus L. On the top of Conacher.
Erica cinerea L. Plentiful.
Calluna vulgaris Salisb. Common.
Veronica officinalis L. Frequent.
Euphrasia officinalis L. Specimens stunted and flowers purplish.
Pedicularis sylvatica L. Very common.
Rhinanthus Crista-galli L. Rare.
Thymus Serpyllum Fries. Abundant.
Prunella vulgaris L. Not common.
Galeopsis Tetrahit L.
M. *Pinguicula vulgaris* L. Frequent.
Primula vulgaris Huds. Plentiful on some of the cliffs.
M. *Anagallis tenella* L.
M. *Armeria maritima* Willd.
Plantago major L.
P. lanceolata L.
P. maritima L. Plentiful, and very variable.—Var. *pygmæa* Lange. Plentiful.
P. Coronopus L.
Atriplex Babingtonii Woods.
**Rumex conglomeratus* Murr. Near the houses.
R. crispus L. Near the houses.
R. obtusifolius Auct. Near the houses.
R. Acetosa L. In great abundance, and most luxuriant on cliffs at north of island.
R. Acetosella L. Common.
M. *Oxyria digyna* Hill. On the north face of Conacher; rare.
Polygonum aviculare L.
Empetrum nigrum L. On hill-tops.
Urtica dioica L. Frequent.
Salix repens L. On Conacher, near village, &c. — Var. *inculacea*.
M. *S. herbacea* L. North face of Conacher, and descending to about 500 ft.†
Potamogeton polygonifolius Pourr.
Orchis maculata L. Common.
Iris Pseudacorus L.
Narthecium Ossifragum Huds.
Luzula sylvatica Beck. Plentiful on the summit of St. Kilda, 1220 ft.
L. campestris DC.
L. multiflora Koch.
**Juncus effusus* L.
J. supinus Mœnch.
J. squarrosus L.
Schœnus nigricans L.
Scirpus uniglumis Link.? Specimen imperfect; may be *palustris*.
S. cæspitosus L.
Eriophorum angustifolium Roth.
Carex pulicaris L.
C. stellulata Good.
C. vulgaris Fries.
C. glauca Scop.
C. pilulifera L.
C. panicea L.
C. binervis Sm.
C. flava L., var. *minor* Townsend.

† Very low for this species. Mr. F. M. Webb found it at 1100 ft. in Mid-Scotland. Trevelyan records it at 1080 ft. in the Faroes.

M. *C. rigida* Good. Mentioned by Macgillivray, and it was seen on the top of Conacher, 1220 ft.
Anthoxanthum odoratum L.
Alopecurus geniculatus L.
Agrostis ———*?* Specimen too young to determine.
Aira flexuosa L.
A. præcox L.
Holcus lanatus L.
Molinia cærulea Mœnch.
Poa annua L.
P. pratensis L.
P. trivialis L.
M. *Festuca ovina* L. Often viviparous.
M. *F. rubra* L., var. *duriuscula*.
Triticum repens L.
Nardus stricta L.
Hymenophyllum unilaterale Willd. Rare on S. side of Conacher.
Pteris aquilina L.
Lomaria spicant Desv.
M. *Asplenium marinum* L.
Cystopteris fragilis Bernh., var. *dentata*.
Nephrodium dilatatum Desv.
Polypodium vulgare L.
**Ophioglossum vulgatum* L., var. *ambiguum*. Among short grass near the extreme north end of St. Kilda.
M. **Botrychium Lunaria* Sw. Near landing place.
Selaginella selaginoides Gray. Rare.
Equisetum arvense L.

NOTES ON BRITISH RUBI:

WITH SPECIAL REFERENCE TO THE LIST IN 'LONDON CATALOGUE,' ED. 8.

By C. C. Babington, M.A., F.R.S.

Having been asked to draw up a catalogue of our native Rubi for the new edition of the 'London Catalogue,' it becomes necessary for me to state the causes of the many alterations and additions which will be noticed in it. It will be also noticed that it differs materially from that recently published in this Journal by Mr. Baker. It is not so perfect as I could have wished, for the time allowed me was short, and the amount of research required has proved far more than could be made before the list was wanted by the printers. I hope that I may be able to much extend my study of the plants, in connection with that of continental specimens, and thus attain a more complete knowledge of them: but time must be allowed for this.

Mr. Baker took Focke and Nyman as his guides, and made his remarks accordingly. I have at Cambridge the whole of Génévier's Herbarium, and also a considerable number of Focke's typical specimens, most kindly sent to me by him. I have therefore done my best, in the time allowed, to identify our plants with those described in Génévier's 'Monographie des Rubus de la Loire,' ed. 2, and Focke's 'Synopsis Ruborum Germaniæ'; also by P. J. Müller and L. V. Lèfevre, in 'Pollichia,' v. 16 and 17; and elsewhere as far as I have access to the descriptions. I find authentic specimens in Herb. Génévier of many Rubi not described by either Focke or Génévier. I have neglected the list given by Nyman to a considerable degree; for he cannot have had such good opportunities as we have to

determine many critical points. He knew very little apparently of the plants of Western Europe as described by Génévier. He had also to make a careful catalogue of all the plants of Europe, not simply of the Rubi. We, as well as Focke and Génévier, are able more to concentrate our attention upon the Rubi. I have, as is well known, especially studied our Brambles, as Focke did those of Germany, and Genevier those of Western France. I find that there is much still to be done before our nomenclature is quite in accordance with that of the great continental authorities. The want of authentic specimens has been a serious difficulty, and now that that is to a great extent removed, the time and labour required to make a proper use of them is almost appalling. We ought, I think, to contrast our southern and western brambles especially with those of the West of France, and our northern plants with those of Germany and Scandinavia. In the former case Génévier is our best guide; in the latter Focke. I have endeavoured to do this, but feel strongly that the results are often not so satisfactory as could be desired. In too many cases much doubt remains concerning the identity of our plants with those of the great continental authorities. Botanists must pardon me if these results are not final, and if I have at a future time to modify my present views in many respects.

Génévier's book is difficult to use, from his system of arrangement often distantly separating nearly allied plants, on account of the colour of their floral organs differing. But we have a local cause of much difficulty from our having almost universally neglected the proportions and colours of the petals, stamens and styles. I believe, with those great authorities, that we have neglected a valuable series of characters. As far as I have been able to make use of them I have found them valuable.

I shall now proceed to make such remarks on the list as it seems to require, omitting all notice of plants which are not likely to be misunderstood or questioned. The numbers in ( ) at the beginning of the remarks on each plant, are those of the 'London Catalogue,' ed. 8.

1. (416b) R. Idæus L., b. *Leesii*. I possess *R. Leesii* as the *R. Idæus* v. *anomalus* from Bromberg, in Focke's 'Rubi Selecti' (32b); also from Kinnekulle in Ostergothland, sent by Rasin to Génévier. Focke says of it that it is the *R. obtusifolius* Willd., but Gandoger ('Rubus Nouveaux') places that next to *R. Thuillieri* Poir., which I believe to be *R. rhamnifolius* W. & N. The *R. Idæus* v. *sterilis* is apparently a very slight deviation from the type. The var. *viridis* has no felt and is green on the underside of its leaves. I have not heard of it in Britain.

2. (420) R. sulcatus Vest. My idea of this plant is that it resembles *R. plicatus*, but has ultimately reflexed, not patent sepals, and stamens exceeding the styles and not connivent; also a decidedly channelled stem. *R. fastigiatus* is a very indefinite name. It is applied to many forms by various authors, and is better neglected. That of Boulay, which Focke identifies with our *R. suberectus*, has the strong hooked prickles of our *R. plicatus*, and

seems to differ from it only by its longer stamens. Génévier joins the *R. sulcatus* Vest. & Focke, received from Areschoug, to *R. fastigiatus*, and does the same with the *R. canaliculatus* Müll. I have seen the true *R. sulcatus* from Perthshire, through the kindness of Dr. Buchanan White. I define it as follows:—

R. sulcatus Vest. *Stem* suberect, *sulcate;* prickles patent or declining from an oblong compressed base; leaves quinate; *leaflets flat*, finely dentato-serrate, with scattered hairs and green beneath; terminal leaflet ovate-acuminate; basal leaflets shortly stalked; lateral leaflets of flowering-shoot often gibbous at the base; inflorescence racemose; rachis and peduncles pilose, not felted; *fruit-calyx reflexed, pale; stamens exceeding the green styles, not connivent.*

I have it from Perthshire, near Blairgowrie, gathered by the late Mr. A. Sturrock, of Rattray.

3. (421) R. NITIDUS W. & N. Stem suberect, pentangular or slightly furrowed; prickles declining or deflexed from an oblong conical base, confined to the angles of the stem; leaves 5-nate; leaflets thick, rather hairy, especially on the veins beneath, finely but irregularly serrate; terminal leaflet oval, acute, or acuminate, subcordate or entire below; basal leaflets subsessile; flowers solitary or subracemose; rachis and peduncles hairy; sepals patent, with flowers and fruit; "stamens reddish, exceeding the violet-coloured styles." The petals are pink.

I find a cultivated specimen from Baker (1867) in the Herb. Génév., which was named *R. nitidus* by Génévier. I also possess one from Briggs, which I named *R. rosulentus* for him. It is from Probus (1869). I now believe it to be *R. nitidus* W. & N., and also of Focke and Génévier. It does not possess the armature of *R. rosulentus*, of which I have not seen any British specimen.

4. (421 b) R. HAMULOSUS L. & M. I have examples of the Thirsk plant, which has borne several names in our herbaria, It seems to be the *R. hamulosus* L. & M. The specimens are ticketed as from Gormire (Baker, Oct. 1860, and Aug. 28, 1865), and named *R. hamulosus:* also from Bardon Mills, S. Tynedale (Baker, Aug., 1863); Kirkby, Lanc. (Harbord-Lewis, Aug. 13, 1879); Sutton Park, near Birmingham (Bagnall, Aug. 8, 1873). Mr. S. Gibson sent it from Hebden Bridge, Yorkshire, as the *R. rhamnifolius* ε. *macilentus* Lees ?. It was once called a fastigiate form of *R. rhamnifolius*. All these I confidently refer to *R. hamulosus*, as Baker formerly did; but I cannot learn from his recent paper how he now names them. Nyman does not seem to know the plant, and with Focke places it doubtfully with *R. nitidus*. In the Herb. Génév. I find specimens of it named, manifestly erroneously, *R. axillaris* Müll.; they are from Thirsk (Baker, Aug. 21, 1865). *R. axillaris* is not noticed by Focke, nor Genevier, nor Nyman, but is described by P. J. Müller in 'Flora' (Regenberg), 1858, p. 139. I place *R. hamulosus* provisionally under *R. nitidus*, next to which it stands in Génévier's arrangement. It differs by its finely but rather doubly serrate leaves; terminal leaflet cuspidate; panicle small, open, scarcely felted, few-flowered, with falcate

prickles; white petals; white stamens equalling the green styles. The calyx also is slightly aciculate, and the leaves are usually not at all notched at the base. The credit of determining the true name of this plant belongs to Mr. Baker, who sent it to me as the *R. hamulosus* Müll. in 1865. Probably it will have to be distinguished specifically.

5. (422) R. AFFINIS. Ours is the plant of Génévier and the *R. cordifolius* of Baker (*teste* Génév.). Our old *R. cordifolius* is probably only a form of *R. rhamnifolius*.

6. (425) R. RHAMNIFOLIUS W. & N. I think that I know this plant tolerably well. A specimen of Bloxam's *R. rhamnifolius* is accepted as correctly named by Génévier; as is also a German one from Minden, which is marked "*verus*" by Areschoug. We have been accustomed to name some forms *R. cordifolius;* but Focke tells us that the true *R. cordifolius* is very rare, and it seems to be different, but I have not seen a specimen of it. Génévier says that his *R. cordifolius* is one of the *Suberecti*, and it is therefore very different from our plant. He places it next to *R. affinis*. *R. Maassii* and *R. Muenteri*, which have been placed here, appear to be forms of our *R. umbrosus*.

7. (428) R. RAMOSUS Blox. I define this as follows:—

Stem erect-arcuate *sulcate;* prickles strong, declining or subpatent from a long compressed base; leaves quinate; *leaflets* coriaceous, convex, *shining*, subglabrous, hairy only on the veins beneath, doubly serrate or *rather lobate towards the tip*, cuspidate, *not imbricate;* terminal leaflet broadly obovate, subcordate below; panicles long, leafy below, with *erect-patent, racemose-corymbose branches;* its top and pedicels hairy, felted with many sunken setæ; *its prickles strong*, declining; *sepals reflexed, ovate, acuminate*, with linear points; petals ovate, white or pinkish; filaments white; styles pinkish.

Génévier has placed a specimen of this near to his *R. racemosus*, which has felted leaves, a very much narrower and decidedly felted panicle, and the prickles on the stem scarcely longer than the length of their bases. I think that we may well separate this from *R. imbricatus*, although the leaflets of that plant do not seem to be always imbricate, as supposed by Dr. Hort. Baker says, "Compare this with *R. vulgaris*," a plant which I only know from Focke's specimen ('Rub. Select.,' 56), and believe to be quite different. Authors are not at all agreed as to what is intended by *R. vulgaris*.

8. (429) R. LATIFOLIUS Bab. has been discovered in a new station in Perthshire by Dr. Buchanan White. Unfortunately we know very little more about it than we knew before, except that the petals are white and the stamens exceed the styles, and are incurved.

The misnamed specimen noticed in 'Brit. Rubi' (266) has misled Mr. Baker and others into supposing that *R. latifolius* is a form of *R. corylifolius*. Also the Monmouthshire specimen ('Brit. Rubi,' 92) is not *R. latifolius*. The *R. latifolius* Boul., a much later name, belongs to *R. corylifolius*.

9. (430) R. THYRSOIDEUS Wimm. The plant which we have been accustomed to call by this name has no right to it. We only

have the true plant from one place, near Plymouth (between Tamerton Foliot and Roborough Down), where it is found by Mr. Briggs. It seems to differ from the plant which we have been in the habit of naming *R. thyrsoideus* (the *R. pubescens* of Weihe and Nees and Focke), by its furrowed and subglabrous stem, with patent prickles, terminal leaflet obovate-lanceolate, and panicles scarcely prickly. It has also a few setæ on its calyx. I define it:—

R. thyrsoideus Wimm.; stem erect-arcuate, angular, *furrowed subglabrous; prickles nearly patent* from a dilated compressed base; leaves quinate-digitate; *leaflets doubly but irregularly and coarsely serrate*, finely white-felted beneath; *terminal leaflet obovate-lanceolate, acuminate;* panicle long, narrow, its branches very short and few-flowered; its *prickles few*, weak, declining or deflexed; petals white; stamens exceeding the styles, ultimately connivent.

Mr. Townsend informs me that he has from the Isle of Wight a plant named *R. elatior* Focke by that botanist himself. This apparently would find a place under the true *R. thyrsoideus*, in its form called *R. candicans* Weihe. Indeed its difference from *R. candicans* is apparently very slight (I have specimens from Focke, Rub. Sel. 36, before me), chiefly in the stems being furrowed throughout, for I cannot detect his other characters upon the specimens.

10. (431) R. PUBESCENS Wirtg. This is undoubtedly the plant we usually know by the name of *R. thyrsoideus*. It has angular (but hardly at all furrowed) pilose stems, with much stronger prickles than the true *R. thyrsoideus*, roundly-obovate acuminate terminal leaflets, a panicle with many falcate prickles below and many slender straight ones above, lanceolate-acuminate sepals, and many setæ on the panicle and calyx. Focke says:—"Stamina stylos superantia post anthesin conniventia vel fructui applicata."

My description in the 'Manual' is fairly correct. Baker places the specimens named *R. geniculatus* from Kew with *R. pubescens*, on the authority of Focke, but those sent to Génévier (Herb. Génév.) can hardly bear that name.

11. (431) R. PUBESCENS W. & N., var. The plant named *R. discolor β. pubescens* by me is certainly not the *R. arduennensis*, as was suspected by Focke, if we may trust a specimen of the plant gathered at "Boppart ad Rhenam," so-named by Focke. Baker considers my plant to be the *R. Linkianus* Ser., which Focke says is the double-flowered bramble of the gardens. But Gussone does not state that his plant is double-flowered, and probably it is not. Still it is very unlikely that our plant and one of the extreme south of Europe should be identical. I have not seen a specimen of the *R. Linkianus* of Seringe or of Gussone, nor have I seen Baker's plant from the Virginia Water. The leaves of my plant are hairy only on the veins beneath on the stronger and older shoots, but ashy-pubescent on the autumnal branches. My specimens are from Llanwarne, Herefordshire, and Piercefield, Monmouthshire.

The *R. discolor* W. & N. is *R. macrostemon* Focke, of which, combined with his *R. asaianthus* and *R. Winteri*, he says, "Specimina exsiccata . . . . . certis notis distinguere nequeo" (p. 193).

Mr. Beeby finds what he believes to be *R. Winteri* in Surrey. But with his specimen and Focke's before me I have doubts, notwithstanding Focke's determination of it.

12. (432) The plant which we call *R. discolor* is the *R. rusticanus* Merc. and *R. ulmifolius* of Focke; and as there seems little doubt of its not being the *R. discolor* W. & N., we must choose one of these names for it. *R. ulmifolius* (Schott) is a rather doubtful name, and belongs to an eastern plant; I therefore think it wisest to adopt Génévier's name, about which we are certain, and call it *R. rusticanus* Merc. Baker sent an unnamed specimen to Génévier, which he found at Kew (Sept., 1867), and I find it named *R. Weiheanus* in the Herb. Génév. I should call it *R. rusticanus*. Neither Génévier nor I have seen authentic specimens of *R. ulmifolius* Schott. *R. Weiheanus* has very finely dentate leaves, which are rather compoundly dentate towards the end, and sepals which are ovate and shortly cuspidate.

The *R. discolor* W. & N. is the *R. macrostemon* Focke.

13. (433) R. LEUCOSTACHYS Sm. is an older name (1824) than *R. vestitus* W. & N., 1825, and I see no reason why it should not be retained, although Nyman considers it incongruous.

14. (433B) My *β.* VESTITUS seems to be the *R. conspicuus* Müll,, and might possibly be separated from *R. leucostachys*. The felt is very different on its leaves, being very fine and close, but wanting the softness of that of *R. leucostachys*.

15. (434) Our R. HIRTIFOLIUS is certainly the *R. pyramidalis* Kalt.

16. (435) R. MONTANUS Wirtg. It seems most probable that our *R. Grabowskii* is not the same as that which grows in Silesia, to which the name belongs. I have always suspected this; and as there seems no good reason to doubt its being the *R. montanus* Wirtg., I accept that name for it. Focke has seen an authentic specimen of *R. Grabowskii*, and says that it is very different. Baker doubtfully identifies my plant with *R. horridicaulis* Müll.

I have specimens named *R. horridicaulis* Müll. by Genevier, from Mr. Baker (St. Ann's Hill, Sept., 1867); also what appear to be authentic specimens in Boulay's "Ronces vosgiennes," Nos. 24 and 24 *bis*. These Génévier would apparently combine with his *R. squalidus*, which is very nearly allied to my *R. fusco-ater*. It has therefore nothing whatever to do with my *R. Grabowskii*, the *R. montanus* Wirtg.

17. (436) R. COLEMANI Blox. is not noticed by Focke nor Grenier under that name, but it seems to be the *R. Boreanus* Génév. published in 1864. But Bloxam's name and description appeared, in 1850, in Kirby's 'Fl. of Leicest.' (p. 38), and will therefore claim priority. I find specimens sent by Baker from Thirsk (Sept., 1865) accepted by Génévier as his *R. Boreanus*, but they are rendered somewhat ambiguous by the presence with them of a stem and leaves of a very different character from the others sent by Baker and from the rather numerous French specimens of *R. Boreanus* in the Herb. Génévier. It may be doubted if the *R. infestus* of Bloxam ('Brit. Rubi,' 128) can be placed here. Its

armature seems so very different. But the whole question concerning the nomenclature of the plants (there are probably more than one) sent out by Bloxam as *R. Colemani* and *R. infestus* requires consideration.

18. (437) R. Salteri Bab. Focke considers this to be *R. sylvaticus* W. & N. Génévier recognises it as distinct. I described it in 1846.

I find specimens from Bloxam of his *R. calvatus* in the Herb. Génév., but there is no remark made upon them. Génévier placed them next to *R. Salteri*, and perhaps considered them to be the same: for he says under *R. Questieri*, in his Monograph, that that is not *R. calvatus* Blox., although it is of Boreau. Focke places *R. calvatus* doubtfully under *R. sylvaticus*; but he also quotes *R. calvatus* Blox. and my *R. foliosus* as partially synonymous with his *R. chlorothyrsus*, on the authority of a specimen from Bloxam. A specimen of *R. chlorothyrsus* now before me ('Rub. Select.,' 44) is not *R. calvatus*, which is so close to *R. Salteri* that I quite agree with Focke in combining them. But I have a single specimen, issued as *R. calvatus* from Twycross in the "set" published by Bloxam in 1876, which does closely resemble *R. chlorothyrsus*, but which I cannot consider to have any relationship to my *R. foliosus*, with which Focke appears to combine it. The specimens issued in Bloxam's former "set" (No. 52 apparently) in 1846, and then named *R. sylvaticus*, are, I think, what I call *R. calvatus*, and that primarily intended by that name by Bloxam. A specimen gathered at Packington and included as *R. calvatus* in the second "set" is *R. calvatus*, as also are specimens sent by Bloxam to Génévier with that name. I am inclined to suspect the presence of some mistake.

18. (438) R. carpinifolius W. & N. I think that I know our plant; and would refer especially to its very finely serrate leaflets, which are densely hairy rather than felted beneath, and its narrow and often nearly simple panicle. My specimens seem to require very careful study. Some of them may belong to other named forms. Some botanists would perhaps refer some of them to *R. vulgaris* W. & N.; but I know nothing of *R. vulgaris* as a British plant. The only specimen which I have seen of it is in Focke's 'Rubi Selecti,' No. 56, which he quotes as being the true plant in his 'Synopsis' (p. 138). It was unknown to Génévier.

19. (439) R. villicaulis W. & N. I agree with Baker in believing our plant to be correctly named. I also believe my *R. adscitus* to be that of Génévier. He quotes me without doubt. There are abundance of specimens in his herbarium, but none from England.

I place here the *R. heteroclitus* of Bloxam (set of 1876) with some doubt, owing to its very nearly, if not quite, naked stem. Focke places the *R. heteroclitus* Müll. with my *R. Grabowskii*, which is *R. montanus* Wirtg.; but that can hardly be its proper place. Müller's specimens (Herb. rub. rhen.) have very much the appearance of some suberect form; not so Bloxam's, which are very like *R. villicaulis* when become completely naked.

I also place here the *R. gratus* Focke. He says of it, "Fl. magni rosei, stamina longissima, sepala patentia externe snbtomentoso-virescentia." I have what seems to be it from Perthshire, by the kindness of Dr. Buchanan White; and Surrey, by the liberality of Mr. Beeby.

(To be continued.)

SHORT NOTES.

Potamogeton coriaceus Nolte.—Last year Mr. A. Fryer sent specimens of the above plant from Cambridgeshire. This is placed by Reichenbach nearest to *P. lucens*, as a variety. Mr. Fryer considers its nearest ally is *P. Zizii*, and in this I quite agree. These Cambridgeshire specimens are the nearest that I have seen from Europe to Nolte's type specimen in Herb. Mus. Brit. It was through my neglect it was omitted in the 8th ed. of the 'London Catalogue.'—Arthur Bennett.

Scirpus rufus Wahlb. in E. Suffolk.—The Rev. Dr. Hind has kindly sent me a specimen of the above plant, gathered many years ago by Sir Charles Bunbury on the coast near Aldborough. Cheviotland and Lincolnshire are the only records of its occurrence on the east coast.—Arthur Bennett.

NOTICES OF BOOKS.

The 'Annual Report of the Proceedings of the Belfast Naturalists' Field Club' for 1884–85 contains, in the appendix, Part i. of a useful list of the Fungi of the North of Ireland, by the Rev. H. W. Lett. It is prefaced by a short summary of the little that has previously been done in this direction, and contains 581 specics, with localities for each.

A very interesting "Sketch of the Flora of South Africa" has been reprinted by its author, Mr. Harry Bolus, from the 'Official Handbook of the Cape of Good Hope' for the current year. In the small space of 32 pages Mr. Bolus has given a readable summary of the botany of the five natural regions into which he divides South Africa, illustrated by an outline map.

The 'Fourteenth Annual Report of the South London Microscopical and Natural History Club' contains an address from the retiring President, Mr. B. D. Jackson, on the botanists, from Ray to Blackstone and Hill, who have recorded the plants of the district. The MS. notes of Newton, Doody and Buddle, relating to the local flora are quoted, as well as those published in the works of Petiver, Ray, and Blackstone.

A new volume (the 17th) of the 'Icones Plantarum,' which is apparently to be devoted entirely to Ferns, was begun in May. It

contains twenty-five plates, mostly of new or hitherto unfigured species, the text being supplied by Mr. Baker.

We are indebted to the author, Mr. Frank Tweedy, for a copy of his 'Flora of the Yellowstone National Park'—a pamphlet of seventy-eight pages, consisting of an introduction, localised list of plants, and summary.

The last part (vol. ii., pt. 2) of the 'Annuario del R. Istituto Botanico di Roma' contains the following papers:—'Sulla struttura e sviluppo del frutto dell' *Anagyris fœtida*,' by E. Martel (1 plate); 'Sugli sferocristalli del *Pithecoctenium clematideum*,' by R. Pirotta; 'Di alcune particolari escrescenze del fusto del *Laurus nobilis*' (2 plates), by A. Baldini; 'Di una nuova specie di *Plagiochila*' (*P. bifida*: 1 plate), by F. Stephani; 'Repertorio della Epaticologia Italica' (3 plates), by C. Massalongo; 'Ancora sui rapporti tra i vasi laticiferi ed il sistema assimilatore,' by R. Pirotta and L. Marcatili.

The 'Stonyhurst Magazine' for May contains a list of the flowering plants and higher cryptogams of a ten miles' radius round Stonyhurst College, in which are comprised portions of the South and West Lancashire and Mid-West Yorkshire districts. "It does not pretend to completeness; its aim is rather to afford a basis on which a complete list may be built up"; and as we gather from the Magazine that the College possesses a Natural History Club, we may hope that the present enumeration may soon be extended. As it stands, it presents a good idea of the local flora.

New Books.—P. Sorauer, 'Handbuch der Pflanzenkrankheiten.' Vol. i. Die nicht-parasitären Krankheiten (ed. 2: Berlin, Parcy: 8vo, pp. xvi. 920 (9 plates, 61 cuts).—A. B. Frank, 'Dr. J. Lennis Analytischer Leitfaden: Botanik' (ed. 2: Hannover, Hahn: 8vo, pp. xvi. 264: 481 cuts). — K. W. v. Dalla Torre, 'Botanische Bestimmungs-Tabellen' (Vienna, Holder: 8vo, pp. iv. 70). — A. Karsch, 'Vademecum botanicum' (Leipzig, Lenz: pt. i., 8vo, pp. 64, 129 cuts: 1 *mk.* 20).

Articles in Journals.

Bot. Centralblatt. (No. 24). — K. van Tubeuf, '*Cucurbitaria Laburni* auf *Cytisus Laburnum*.'

Botanische Zeitung (May 28). — J. Wortmann, 'Theorie des Windens' (concl.).— (June 4). A. de Bary, 'Ueber einige Sclerotinien und Sclerotienkrankheiten.'

Gardeners' Chronicle (June 5). — J. D. Hooker, *Larix Griffithii* (fig. 157).—*Picea Menziesii* (figs. 161, 162).

Œsterr. Bot. Zeitschrift (June).—E. Formánek, 'Zur Flora der Karpathen.' — W. Voss, 'Bildungsabweichungen an Frühlingsblumen.'—H. Steininger, '*Pedicularis Jankæ*, sp. n.'—J. Wiesbaur, 'Ueber Veilchen.'—K. Vandas, 'Zur Flora Wolhyniens' (*Dianthus Borbasii*, sp. n.).—J. B. Keller, 'Mährische Rosen.'

NOTES ON BRITISH RUBI:

WITH SPECIAL REFERENCE TO THE LIST IN 'LONDON CATALOGUE,' ED. 8.

By C. C. Babington, M.A., F.R.S.

(Concluded from p. 223.)

22. (440) R. Maassii Focke. Focke says (p. 153) that this is *R. Münteri* Marss. and *R. Maassii* Focke. I think that it is the latter; but I have not seen the former, nor do any of my specimens seem to accord with Focke's remarks upon it. We have been in error in considering our plant to be the *R. vulgaris* b. *umbrosus* W. & N. and *R. umbrosus* Arrh.; for Focke appears to be quite correct in considering that to be the *R. pyramidalis* Kalt., our former *R. hirtifolius*. Again, *R. ramosus* Génév., of which I have authentic specimens before me, is not this plant: we have been misled by specimens, supposed to have been so named by Génévier, gathered by Baker "by the railway-bridge at Woodend, Yorkshire, Aug., 1865." Again, the plant found at Morden, Durham, Aug., 1864, and called *R. atrocaulis* by Génévier for Baker, is certainly wrongly named; it is probably *R. Maassii*. I have the true *R. atrocaulis* before me. Thus I think that I have removed several of the errors into which we have been led. Focke told Baker that the form of *R. rhamnifolius* usually called by us *R. cordifolius* is *R. Maassii*; but surely there is some mistake. I may be wrong. but certainly think *R. Maassii* far nearer to *R. macrophyllus* than to *R. rhamnifolius*.

The fine but compound dentition of this plant is remarkably beautiful. Can it be that my *R. macrophyllus* ε. *glabratus* is a glabrous form of it? Dr. White finds in Perthshire what may probably be the *R. Münteri*, which differs from *R. Maassii* by its stellately pilose stem, and suborbicular or broadly elliptical and densely serrate terminal leaflets. But I must leave it for future consideration.

23. (441) R. macrophyllus W. & N. I agree with Baker in combining several plants under this name, viz., *R. Schlechtendalii*, *R. piletostachys*, and probably *R. amplificatus*. *R. piletostachys* I combine with *R. Schlechtendalii* with some little doubt, for I am not acquainted with the true plant as British. I also doubt the identity of the plants of Focke and Génévier.

If I understand Mr. Briggs correctly, he suspects that my var. *glabratus* may be the *R. Bamingii* Focke, the *R. pyramidatus* Müll. I have a specimen of *R. Bamingii* from Focke before me, and they are certainly not the same. My plant is well-marked by its orbicular terminal leaflet, and other points. We want information about the proportions, colour, &c., of the floral organs. I have seen what seems to be a form of it from Perthshire with felted leaves, which appears to connect this with the other forms of *R. macrophyllus*. I have also a specimen which Dr. Boswell found in a wood near Balmuto, in October, 1873, and called a "shade *R. cordifolius*" of Baker and Bloxam, and *R. Lindleianus* of Warren,

with the remark, "I cannot believe this to be *R. rhamnifolius* with such a panicle. The thin leaves and long narrow petals look like *R. Lindleianus*, but the habit is that of *R. macrophyllus*.' I consider it to be a connecting-link between *R. amplificatus* and the var. *glabratus*. Its leaves are very nearly naked beneath, having only a few scattered hairs. The dentition also is like that of var. *glabratus;* similarly the panicle. But all the specimens in our herbaria named *glabratus* require very careful re-examination. Can it be, as I have hinted above, that the whole should be placed under *R. Maassii* as glabrous forms?

24. (442) R. MUCRONATUS (Blox.). I am pleased to learn that our old name may be retained; for there is reason to suppose that the plant of Seringe is only a form, even if more than a synonym, of *R. triflorus* Rich., and that therefore our name is free for us to use.

I have several specimens of the French *R. mucronulatus* before me, and think with Baker that they are not the same as our *R. mucronatus*. I have long had doubts on the subject, but authority was strongly against me. Now at last I have specimens to judge from Herb. Génév., and must place the French plant with the *Glandulosi* rather than the *Spectabiles*. But Génévier, with abundant specimens of the English and French plants before him, has combined them. Amongst his English specimens I find one (Thirsk, Aug. 28, 1865, Baker) much more nearly resembling his *R. mucronulatus* than do the others, by having nearly the same armature on the stem, and a tendency to compound dentition near the end of the terminal leaflet. Nyman combines the French plant with *R. hirtus*, thus placing it amongst the *Glandulosi*, but does not give England as a locality for it.

25. (443) R. SPRENGELII Weihe and R. BORRERI Bell-Salt. I am inclined to let these plants stand under one name. Their differences are scarcely more than would result from strength of growth, and *R. rubicolor* Blox. lies between them. *R. Arrhenii* Lange is very near *R. Borreri;* chiefly differing by its orbicular petals, and stamens much falling short of the styles.

25. (444) R. ERUBESCENS Wirtg. Stems arching; prickles many slender, straight, patent or declining from a short compressed base; leaves quinate, green and nearly naked beneath, doubly dentate-serrate; terminal leaflet broadly obovate cuspidate; panicle rather lax, hairy, felted, rather setose; its axillary branches short, ascending, the ultra-axillary ones patent, corymbose; its prickles slender, declining, a few stronger and rarely deflexed; sepals ovate, much acuminate, setose.

I have not seen the flowers, nor do I find any description of them, except that the petals are "lactei" and that "deinde styli cum filamentis erubescentes." Bloxam sent it to Génévier as *R. Borreri*, but he appears to have suspected that it was *R. erubescens*. The English specimens that I have seen are from Mancetter, in Warwickshire, and near Ross, Herefordshire.

26. (445 B) **R. thyrsiger** Bab. MS. *R. rhenanus* Müll. depends, as far as we are concerned, upon a specimen from Crabtree, in Devonshire, marked in my hand as authentically so-called

by Génévier, but upon what authority does not appear. There is no plant bearing that name in the Herb. Génév., although a specimen gathered at "Plymbridge, Devon," apparently by Areschoug, is there named *R. Bloxamii*, but is really the Plymouth plant, which I now call *R. thyrsiger*. Genevier made no remark upon that specimen. As the description of anything named *R. rhenanus* cannot be found (even in Gandoger's enormous list), I hope that I may be allowed to correct my mistake; and, as I think that the plant deserves distinction, describe it as follows:—

R. THYRSIGER Bab. MS. Stem arcuate-prostrate, angular, slightly furrowed; prickles small, declining from a long compressed base, unequal; aciculi, setæ, and hairs short, many; *leaflets dentate-serrate*, green on both sides, pilose on the veins beneath; *terminal leaflet obovate-cuspidate; panicle long, pyramidal*, very hairy and setose, *nearly leafless, with long corymbose long-stalked few-flowered branches*, and many slender prickles; sepals ovate-acuminate, loosely reflexed from the fruit.—Very hairy, except on the leaves. The naked panicle with few- or single-flowered branches is the most marked distinction. It is very different in that respect from *R. Bloxamii*. Apparently the flowers are white, and the stamens exceed the styles; but these points require attention on the living plant.

27. (445) R. BLOXAMII Lees. There is a beautiful series of this in Herb. Génév., named by Baker, from Laskell (Aug. 12th, 1865), and Bloxam, from Twycross and Atherstone, which are quoted ('Rub. Loir.' 140) as the authority for the name. Attached to one of them is a long MS. description by Baker. There cannot therefore be any doubt about Génévier meaning the same plant as we do by this name. *R. splendidus* Müll. is a synonym of it, published twenty years later.

28. (446) R. THYRSIFLORUS W. & N. I find several British specimens so named in the Herb. Génév. from the following places:—Ingleby, Yorkshire (Baker, Sept. 1866), sent as *R. Koehleri*, and Rumple, Devon (Briggs, Aug. 4, 1865). In my own Herb. I have what I believe to be the same plant (1) from Bloxam's "set" of 1876, from a wood between Pavy and Tamar, Devon (Briggs); (2) from Wrottsley Wood, near Wolverhampton (Fraser, 1877); (3) from Moreton Hampstead, Devon (Moyle Rogers, Aug. 15th, 1881); and (4) from near Kenilworth (1854), from Mr. Kirk. I therefore retain the name in our list.

R. philyrophyllus L. & M. I identify a plant found by the Rev. Dr. Hind at Honington, Suffolk, with this. It seems to agree exactly with specimens named by Müller and Génévier. It was published by P. J. Müller in 'Pollichia' of 1859, p. 117. It is not included in Génévier's and Focke's books, not being found in their districts; and the former placed it in his Herb. near to *R. Deseglesii*, with doubtful correctness, in my opinion.

R. thyrsiflorus differs from *R. Bloxamii* by having much more unequal *declining prickles*, a broadly obovate acuminate *finely serrate terminal leaflet*, a panicle with its ultra-axillary cylindrical part racemose, usually rather dense strong axillary racemose branches,

and strong declining prickles. On one of Dr. Fraser's specimens the terminal leaflet is broadly cordate-acuminate, and the aciculi and setæ on the stem are fewer. *R. philyrophyllus* much resembles this specimen, but has a much more hairy under side to its leaves. It has a cordate terminal leaflet, and a short and apparently ultra-axillary panicle.

All these forms require much careful study with better materials than I possess.

29. (447) R. ROSACEUS and R. HYSTRIX. I place these under one name, as Baker has done, *R. rosaceus* being the older name.

R. chlorothyrsus Focke seems to come here. Focke received a specimen of it from Bloxam, confounded with *R. calvatus* Blox. Is this also the *R. foliosus* of Bloxam's "set" of 1876? The chief difference of that specimen from *R. chlorothyrsus* is its abundant equal minute aciculi and setæ on the stem. *R. chlorothyrsus* is stated to be "sparsim glandulosi v. eglandulosi," and those organs are very scarce on my specimen from Focke ('Rub. Select.' 44).

30. (448) R. PRÆRUPTORUM Boul. Baker combines this with *R. Radula*, but I cannot agree with him. To mention only two conspicuous characters: *R. Radula* has felt beneath its leaves, *R. præruptorum* has none. The former has finely dentate leaves, the latter "dents plus grandes."

31. (449–451) R. SCABER has long appeared to be probably an aggregate plant, and now the wish seems to be to distinguish its segregate forms. This has for some time been done on the Continent. It appears to include three British forms, which I now call *R. scaber*, *R. debilis*, and *R. Babingtonii*. *R. scaber* W. & N. has a spreading usually divaricate panicle, and a very prickly stem, resembling that of the *Koehleriani*. Génévier identifies a specimen from Hartshill (Bloxam) with the true plant. The branches of its panicle are much more ascending than those of a specimen, precisely similar in other respects, which I possess from the same place, and also named by Bloxam. My specimens accord exactly with Génévier's specimens of *R. scaber*. I have it from Sutton Park, near Birmingham (Bagnall), but rather less prickly than usual; Bodmin (Briggs); Hartshill Wood (Bloxam); Prae Wood, near St. Albans (Coleman); and Calstock (Briggs). Focke seems not to have seen British specimens of the true *R. scaber*, but only of *R. Babingtonii*, sent under the name of *R. scaber*, and therefore does not admit that we have *R. scaber*. Not so Génévier, who received the true plant from Bloxam.

The *R. scaber* of Wirtgen and also his *R. perplexus* are the *R. Kaltenbachii* Metsch, which is a very different plant, and must be placed near *R. hirtus*.

R. Babingtonii is now allowed to be distinct from *R. scaber*. It is usually a very much stronger plant, and does not seem to have been known to our specialists as existing in France or Germany. They neither of them notice it, unless *R. adornatus* Müll. is the same. I define it and its allies as follows:—

(1). *R. Babingtonii* Bell-Salt.; stem arcuate-prostrate, terete or

subsulcate; prickles many, short, declining from a long compressed base; strong short aciculi as well as setæ and hairs few; leaves 3–5-nate; leaflets doubly dentate, opaque and pilose above, pale green and pilose beneath; *terminal leaflet* broadly obovate-*cuspidate*, subcordate below; *panicle* usually large, *leafy*, with subracemose or nearly simple branches; its prickles few, small, slender; its aciculi and setæ slender, few, except near the top of panicle and branches; sepals lanceolate-acuminate, leaf-pointed, erect-patent with fruit; stamens equalling or exceeding the styles.—The *R. scaber* of the 'Plymouth Flora' may be a strong form of it. *R. Babingtonii* was described, in 1845, in 'Ann. Nat. Hist.' xv. 307.

(2). *R. debilis* Boul.?; *stem* arcuate, 5-gonous, *with flat sides; prickles* small, deflexed from a long compressed base; *aciculi* few, *slender*, unequal; setæ very few, inconspicuous; hairs few or none; leaves 5-nate-pedate; *leaflets* rather *coarsely crenate-dentate*, pale green and nearly naked beneath; *terminal leaflet cordate-ovate acuminate;* panicle long, leafy, rather narrow, with short axillary racemose branches; its prickles and aciculi small and slender; its setæ and hairs short, unequal; sepals lanceolate-acuminate, leaf-pointed, patent (?) with fruit; stamens long, exceeding the styles, incurved; "petals white."—Boulay describes his *R. debilis* as having "tige faible, procumbente, cylindrique"; but Génévier says, "obtusement anguleuse"; also the leaves of our plant are more coarsely dentate (or, as I might say, crenate-dentate) than those of my continental specimens, especially the authentic ones of Boulay; and on all the specimens called *R. debilis* by Génévier the terminal leaflet is also much more cordate than on our plants. It is very possible, therefore, that our Plymouth plant is not the true *R. debilis* Boul., although distinct from *R. scaber*. This is probably the plant referred to by Génévier on p. 164.

(3). *R. scaber* W. & N.; *stem* prostrate, *terete* or *5-gonous;* prickles small from a compressed base, deflexed or declining, strong, very short; aciculi, setæ, and hairs few; leaves 3–5-nate; leaflets unequally and finely dentate, pale green and pilose beneath; *terminal leaflet broadly obovate-acuminate*, subcordate below; *panicle nearly leafless, with patent corymbose branches;* sepals leaf-pointed, erect-patent with fruit; petals narrowly oblong, white; stamens white, much exceeding the green styles, ultimately incurved.

32. (452) R. ECHINATUS, R. RUDIS, and R. CERTIFLORUS. I find much difficulty here. Mr. Baker's specimens from "hedges at Chertsey, Sept. 1867," and "cultivated at Kew, 1867," are accepted by Génévier as *R. rudis*. I think that this and our plant called *R. rudis* are the *R. echinatus* Lindl., so-named in 1829, and it ought to bear that name. It is not the *R. rudis* of Focke, of which I find specimens considered as characteristic by Focke in the Herb. Génév. I have also the specimens quoted by him as illustrative of his *R. rudis*, and a beautiful series from himself. They have the "inflor. amplæ, ramuli divaricati," considered as characteristic of *R. rudis* by Focke. They are similar to the Surrey plant gathered by Mr. Beeby at Reigate, and another gathered by Areschoug at Kilburn, Middlesex. These plants seem to me to have no relationship with *R. Leightoni*, which I consider to be a form of *R. Radula*.

Bloxam issued a "*rudis* with small leaves" in 1846, and "*rudis* var. *microphyllus*" from the same place (Sweepston) in 1845, and also in his "set" of 1876. These resemble the *R. sertiflorus* Müll., as illustrated in the Herb. Génévier. A specimen will be found from the Herb. Borrer at Kew. I possess it gathered by Mr. Purchas at Lidney, Gloucestershire. It seems to be more nearly allied to *R. rudis* than to *R. echinatus*.

33. (455) R. Radula γ. denticulatus Bab. is a doubtful plant, which seems to connect *R. Radula* with *R. rosaceus*. I omit it until we can learn more concerning it. My specimens are from Loxley, near Sheffield (Newbould). I have not yet identified it with any described species. Should it prove distinct, I should like to call it *R. Newbouldii*. See 'British Rubi,' 195, for a full description of it. But if accepted as a distinct species it can only date from this paper.

34. (456) R. Koehleri Weihe. A specimen gathered at Twycross by Bloxam is accepted by Génévier as the true plant. He placed with it one from "Falkenberg in Saxonia," sent to him by Areschoug as "forma typica!" I think that this latter is certainly our plant. I have not seen a specimen of Focke's typical plant.

b. *R. infestus* Weihe. Génévier admits specimens of our plant to be correctly named. Focke also admits it, but places it far from *R. Koehleri*. I am not prepared to say that he is not correct in so doing: future study must determine it. I cannot now give any opinion.

c. and d. *R. egregius* Focke and *R. Schlickumi* Wirtg. I include these on the authority of Baker. He states that *R. Purchasii* Blox. is near the former. Its panicle approaches that of *R. mucronatus*. Its stem bears setæ and gland-tipped prickles. Through the kindness of Focke, I possess a good series of *R. egregius*, and should certainly place it near our *R. infestus*. It has usually ternate leaves; *R. Schlickumi* has them quinate. The inflorescence of the latter plant is lax, its sepals wear a rather greenish coat of felt, and its petals are narrow and pinkish. The inflorescence of *R. egregius* is dense, its sepals are white-felted, and its petals broader and white. But these differences may probably not be important, and I do not know how far they apply to the British plants referred to by Baker. I derive them from continental specimens. Focke named a specimen doubtfully *R. melanoxylon* Müll., which seems very near to *R. Schlickumi*. It grew at Merstham, Surrey.

e. *R. pallidus* Weihe. Génévier placed various specimens of *R. pallidus* together, and seems to have had much doubt concerning them. He has applied various names to them; all, as I conceive, erroneous. He does not seem to have found our plant in France. Probably Focke was correct when he told Baker that it is a shade form of *R. Koehleri*. I do not think that it is *R. apricus* Wimm., of which I have specimens before me. Nor does it seem to be *R. pallidus* of Focke. The coarsely dentate but broad teeth on the leaves are those of my *R. pallidus*, not of that of Focke, to which he quotes R. G. t. xxix., which I rather incline to consider our *R. pallidus*. He also quotes his own 'Rubi Select.,' 51, under *R.*

pallidus, but states on p. 42 that that specimen belongs to *R. incultus* of Müller and Wirtgen, and a second time quotes the same specimen under that name on p. 369. I therefore retain our name *pallidus* as that of a variety of *R. Koehleri*.

f. *R. cavatifolius* Müll. I do not observe that Baker has taken any notice of my *R. cavatifolius*, which I retain as a form of *R. Koehleri*, and have characterised in my former notes and in the 'Manual,' ed. 8. I have now seen specimens of it from Trelleck, Monmouth; Bishopstoke, Hants (Groves); Fakenham, Norfolk (G. Fitt); and Tor Point and Anthony, Cornwall (Briggs).

Génévier named a plant sent by Baker to Déséglise (Sept. 1864), and gathered at Clives, Yorkshire, *R. longicuspis* Müll. It was called *R. Koehleri* by Baker, and requires further study.

35. (457) R. FUSCO-ATER Weihe? I do not know the *R. badius* Focke, and therefore think it best to retain the name usually employed in England. Focke does not seem to know our plant with certainty. Génévier refers to it under the name we use, but then he also quotes the *R. fusco-ater* of Focke; he had, however, a specimen before him from "Gallows Lane, near Mesham, and Twycross," sent as *R. fusco-ater* by Bloxam, and, as I believe, correctly named, according to our ideas. I do not know the *R. fusco-ater* of Focke (except from the plate in 'Rubi Germ.' (xxvi.), as I do not appear to possess the specimen of Wirtgen (H. R. R., ed. 1, n. 64), to which he refers), except from a specimen gathered by him at "Letmalhe, in Westphalen," which I should have considered as *R. fusco-ater*; but then he places it amongst his *Hystrices*, where I should not place his specimen now before me. Specimens named *R. fusco-ater* by Génévier agree admirably with ours.

I place the *R. horridicaulis* Müll. here on the authority of Baker's specimens from St. Anne's Hill (Sept. 1867), to which I have already referred under *R. montanus*, and French ones named by Boulay and Génévier.

R. squalidus Génév. is exceedingly near to *R. fusco-ater*, differing chiefly by its "organes incolores"; that is, it has "etamines blanches . . . styles verdâtres"; but *R. fusco-ater* has "etamines roses . . . styles roses."

36. (459) R. DIVERSIFOLIUS Lindl. This is the *R. myriacanthus* Focke, *R. diversifolius* of Génévier, and I quite believe of Lindley in his 2nd edition. I know nothing of the plant of Tineo, nor does Nyman mention it. I therefore retain Lindley's name published in 1835. I possess a fine series of English specimens, all so-named by Génévier, from Thirsk, Sessay, Cadeby, and Twycross. I do not consider it advisable to accept *R. horridus* as the name of an aggregate species, for the Swedish specimens differ greatly amongst themselves; some are much like our *R. pallidus*, others are *R. diversifolius*. The remarks of Arrhenius show the difficulty attending the appropriation of the name *R. horridus*. Some of the specimens included by Génévier under *R. diversifolius* were originally named *R. ferox* Bœningh. *R. ancistrophorus* M. & L. is considered by Génévier to be a white-flowered variety of this; it does not seem

to differ in other respects. *R. myriacanthus* has white petals. *R. horridus* Schultz, under which Focke places a plant sent to him by Beeby, has red flowers, according to him.

R. asperrimus Rip. There are two British cultivated specimens referred to this by Génévier. They are ticketed "*R. corylifolius* v. *Wahlbergii* cult. ex Horto Kew, 1867." As Baker supposed, they seem to be a form of *R. corylifolius*, not *Wahlbergii*, but *conjungens*. The true French *R. asperrimus*, placed in the same packet with them by Génévier, seems very different, and is apparently our *R. diversifolius*. A specimen from Sheen Common (Sept. 1876) is called *R. aspericaulis* L. & M. by Génévier, and seems to be a form of *R. diversifolius*. It was sent to Génévier without any name by Baker.

37. (460) R. MUTABILIS Génév. Under his description of this plant Génévier says that my plant is a form of *R. scaber* with white flowers and finely dentate leaves. But he was not referring to what I have recently considered as *R. mutabilis*, and which I possess so-named by him for Baker, and gathered at Cleves, Yorkshire (Sept. 1864), and find in his herbarium from the same place and date under that name. I also find there the plant of Briggs from Tamerton Foliott, named *R. mutabilis* v. *nemorosus*. I think, therefore, that the true plant grows in Yorkshire and Devon. The other specimen which I had in view ('Br. Rub.' 188) is certainly *R. Babingtonii*.

38. (461) R. LEJEUNEI Weihe? Génévier considered our plant to be the same as his. Focke excludes it, but does not tell us clearly where he would place it: probably he calls it *R. Fuckelii* Wirtg., to which he refers the *R. Lejeunei* of Wirtgen. This question will have to be reconsidered at a future time. I prefer following Génévier at present.

39. (461 b.) R. FESTIVUS M. & W. This plant does not fit well into our arrangement. I have been accustomed to suppose that it was closely allied to *R. mucronatus*, but now I suspect that it may approach more nearly to *R. Lejeunei*. It is found in Perthshire and Cheshire. It has rather thin and doubly dentate leaves, with some of the teeth sometimes rather coarse.

This plant shows us how very imperfect our grouping of Brambles still is. Wirtgen places *R. obscurifrons* M. & W. and *R. festivus* amongst the *Spectabiles*. I place them doubtfully with *R. Lejeunei* (next to which Focke places them) in the group *Koehleriani*. Warren put *R. festivus* next to *R. fuscus* with the *Bellardiani*. Baker places it under *R. infestus*. It does not seem to have been known to Génévier.

40. (462) R. LONGITHYRSIGER Lees. Our plant clearly cannot bear the name of *R. pyramidalis*, for Kaltenberg had long before applied that name to what we have been calling *R. hirtifolius*. We therefore fall back upon Lees's name for our plant.

41. (463) R. FLEXUOSUS M. & L. This is our *R. Güntheri*, to which I was inclined to give the name *R. saltuum* (1870), as is done by Focke; but *R. flexuosus* is a far older name (1859). I have failed in finding specimens of the *R. Guentheri* of Génévier, but

think it probable that it is not the same as that of Focke. I do find plenty of *R. flexuosus;* and amongst them our *R. Güntheri*, from Atherstone (Bloxam), marked as certainly the *R. flexuosus* Müll. ! I think that we may safely conclude that we do not possess the true *R. Güntheri*, but have the *R. flexuosus* M. & L.

42. (464) R. SAXICOLUS Müll. My *R. humifusus* is undoubtedly the *R. saxicolus*. I have the specimen (Wirtg. H. R. 151) quoted by Focke; and in the Herb. Génév. I find an abundance of British specimens so-named by him: one from "Byland, Sept. 2nd, 1865," he named *R. sphenoideus* Boul., with the remark, "extremement voisin du *R. offensus* Müll.," and indeed it is exactly like the authentic specimen of *R. offensus* now before me. I think that *R. offensus* and *R. sphenoideus* (1869) are the same. The date of *R. offensus*, or where it is described, I do not know. It is not noticed by Nyman, nor indeed is *R. sphenoideus* which was described by Boulay ('Desc. des Espèces,' 150).

43. (465) R. FOLIOSUS Weihe. I find in the Herb. Génév. specimens from Twycross and Atherstone (both from Bloxam), placed without doubt under *R. foliosus*. They closely resemble the plant from Hartshill Wood, which I named *R. foliosus*. Bloxam also sent it from Bunnersley Coal-field, and his name is again accepted. The *R. foliosus* of Bloxam's 'Fasciculus, No. 102,' has the cordate-based terminal leaflet of the typical plant. It was gathered in 1847. But another specimen from Twycross (1869), considered by Bloxam to be the *R. atro-rubens* Wirtg.), has that leaflet narrowed below, as in *R. adornatus* Müll. I believe that all these belong to one species: the *R. foliosus* Weihe. The Bunnersley Coal-field plant from Bagnall seems to connect them. I think, therefore, that the names *R. adornatus* and *R. atro-rubens* may be omitted from our list as synonymous with *R. foliosus*.

Focke says that he has received a specimen from Bloxam with the name "*R. calvatus* (saltem pro parte sec. specimen a Bloxamo nissum)" which he calls *R. chlorothyrsus* Focke, and adds that my *R. foliosus* "vix diversus esse videtur." At the first glance there is an appearance of similarity to our *R. foliosus*, but the plants seem to me to be really very different. My only specimen of *R. chlorothyrsus* (F. R. S. 44) is very like Briggs's *R. foliosus* from Cornwood, Devon (Aug. 13th, 1879), which Bloxam called *R. foliosus*; but Briggs justly considers them to be different. The Cornwood plant represents *R. foliosus* in Bloxam's "set" of 1876. This plant seems rather to belong to the *Rudulæ* than the *Glandulosi*, and to be very near to *R. rosaceus*. Its chief difference from *R. chlorothyrsus* lies in its abundant minute equal aciculi and setæ on the stem. *R. chlorothyrsus* is stated to be "parsim glandulosi vel eglandulosi," and on Focke's specimen those organs are very scarce.

44. (466) R. BELLARDI Weihe. I have separated two plants from this: one long known to us as *R. hirtus*, the other *R. pendulinus* Müll., which we had not previously recognised. Concerning both of these I remark below. I adopt *R. Bellardi* as the name of our plant because *R. glandulosus* included very many glandular forms; *R. hybridus* is very ambiguous. I do not see the benefit of

adopting these old names, unless it is quite certain to what they would now apply; neither does it seem desirable to take up some neglected name from some forgotten paper or obscure inaugural dissertation.

R. dentatus Blox. is exactly the *R. derasus* Müll. (in 'Pollichia,' 1859, 166). It is not noticed by Nyman. It is the *R. Mülleri* Wirtg. ('Herb. Rub.' ed. 1, 104), *R. geromensis* Müll. Bloxam's name with a description was published in 1850, and must be retained. Focke refers *R. geromensis* to *R. serpens* of Weihe, but not of other authors, who give that name to one of the *Cæsii*.

The characters of *R. Bellardi* and *R. hirtus* do not seem to require alteration from those given in my 'Manual.'

45. (467) R. PENDULINUS Müll. A curious specimen found by Baker "abundantly in a hedge about a mile south of Haslemere," in July, 1869, and called *R. Bellardi* doubtfully, seems to be the *R. pendulinus*, of which I have authentic specimens before me. It is nearly allied to *R. Bellardi*, but apparently quite distinct. Baker found all the leaves ternate, and so they are on the original specimens sent by Boulay to Génévier. But other specimens have 5-nate leaves. Baker says on the ticket that the "styles are claret-red, petals white and not longer than the sepals." The stamens also seem to fall short of the styles. The inflorescence is very narrow and nearly altogether ultra-foliaceous, with very short few-flowered branches, and a more or less wavy rachis. The calyx is erect-patent with the flowers, and shows that it is probably reflexed from the fruit. I define it:—

R. pendulinus Müll.; stem arcuate-prostrate, very nearly round; prickles small, weak, declining from a short compressed base; aciculi and setæ abundant, short, nearly equal; hairs few; leaves 3–5-nate; *leaflets* hairy only on the veins beneath, *finely* but rather irregularly *dentate*: leaflets of ternate leaves nearly equal, broadly subcordate-obovate; terminal leaflet much acuminate; *panicle short, narrow*, flexuose, felted, hairy, very aciculate and setose; its branches short, 1-flowered or racemose, mostly ultra-axillary, its top racemose; its prickles very small, slender, declining; sepals ovate-attenuate, aciculate, setose, felted, erect-patent with flowers reflexed from fruit; petals small, white; stamens exceeding the pink styles. — The young carpels are hairy; in *R. Bellardi* and *R. hirtus* they are glabrous; the styles of those are also greenish white.

46. (468) R. HIRTUS W. & N. I find many specimens of this in Herb. Génév., including two from England: (1) Atherstone, Bloxam; (2) cultivated at Kew, Baker. They agree well with the foreign specimens.

R. rotundifolius Blox. is a rather marked form of *R. hirtus*. It is not the *R. rotundifolius* Weihe quoted by Focke, but is the *R. amictus* Müll. Probably many other slightly varying forms might be separated from *R. hirtus*. I do not know any British *R. fuscus* which is distinguishable from *R. hirtus*.

47. (469) R. REUTERI Merc. I cannot find any notice of this in the 2nd edition of Génévier's work; in the 1st it is described on p. 123. There are specimens in the Herb. Génév. under this name.

It was originally described by Mercier in Reuter's 'Cat. Pl. vasculares de Généve,' ed. 2, p. 272, and I have a specimen authenticated by him. I have also a specimen named *R. Reuteri* v. *cordifolius* by Génévier, which was gathered at Thirsk (July, 1865), but under what name, if any, Baker sent it to him does not appear. The difference between the leaves of the two plants is so great that I could hardly have believed them to be the same had not Génévier combined them. I wish he had given us his matured opinion. *R. Reuteri* is not noticed by Nyman.

Specimens from (1) Sellack, Herefordshire, Ley; (2) Penyard Wood, Herefordshire, Purchas; (3) Kirkby, Lancashire, Lewis; (4) Banchory, N. B., J. Sim; (5) between Thirsk and Topcliffe, Yorkshire, Oct. 1851, Baker; all agree fairly well with the authentic specimens of *R. Reuteri*. They differ so materially from the other forms of the old *R. glandulosus* that it seems best to keep them separate.

48. (470) R. Balfourianus Blox. It is possible that several forms are included under this name: perhaps incorrectly so. Focke places it in the heterogeneous collection included by him under *R. dumetorum*. He seems not to have carefully studied the *Cæsii*. On the other hand, Génévier has distinguished thirty-four plants in his group *Triviales*, which corresponds with our *Cæsii*, and adopts *R. Balfourianus* as one of them. He had an abundance of specimens, including one named by Bloxam and another by Baker.

49. (471) R. corylifolius Sm. Our *R. corylifolius* is not at all satisfactory as it now stands. The typical plant, *R. sublustris* Lees, is well marked. The other forms require much attention. Unfortunately Bloxam sent my var. *conjungens* (from Peckleton) to Génévier as my *R. latifolius*. How he was led to give it that name I know not. Apparently the *R. latifolius* Boulay belongs to *R. corylifolius*. It is a much later name than mine. But he states that it has no setæ on the stem. Those organs are often exceedingly scarce on our plants. Génévier placed Bloxam's and Boulay's specimens in the same cover. There is a plant in Perthshire closely approaching the *R. sepicola* L. & M., which may be the same as my var. *conjungens*. At first sight it much resembles *R. latifolius*. Its terminal leaflet is more cordate than that of *R. sepicola*, its stem more furrowed, and there are a few sunken setæ on the panicle.

My var. *purpureus* is exactly the *R. fasciculatus* Müll., described in 1858 by him, and also by Boulay in 1866. If distinguished, it must bear that name.

50. (472) R. deltoideus Müll. Our plant agrees so nearly with this, which was described in 'Regenberg Flora' (1858, 181), as shown by authentic specimens in the Herb. Génév., that I consider it best to adopt it for our *R. althæifolius*. Our plant differs considerably from the only specimen of *R. althæifolius* which I possess, given as so-named to Génévier by Le Fevre, which seems to be a form of *R. corylifolius*.

Baker sent unnamed specimens from Thirsk (July 7th, 1865) to Génévier, which are named *R. acerosus* Müll. by the latter. I find

the same plant named *R. acerosus* by Génévier, and gathered at Oulton on the same day. Is the same spot intended by both tickets? I incline to place them under *R. deltoideus*. *R. Mougeoti* Bill. is very nearly the same, and Génévier seems to have considered them as one species in 1865. I find both in the Herb., but *R. Mougeoti* alone in the Monograph. He seems not to have well understood the plants at that date, for I have other specimens from Thirsk, named *R. ligerinus* Génév. and *R. degener* Müll. teste Génév. In giving these names I think that he was wrong, and had then confused a form of *R. cæsius* with *R. deltoideus*. *R. Mougeoti* has rose-coloured petals, and stamens falling short of the styles. *R. deltoideus* has white petals, and stamens exceeding the styles.

In addition to the recorded station for this plant, I have received what I believe to be the same from Dr. Buchanan White, of Perth.

I cannot find the description of *R. acerosus* Müll.

51. (473) R. SCABROSUS Müll. is apparently my *R. tuberculatus*. Muller described his plant in 1856, and it is therefore the older name. *R. scabrosus* has stamens exceeding the styles, and white petals. I described the stamens and styles of my plant as yellowish white, and the petals pink. It is clear, therefore, if we may place any confidence in such differences, as the highest foreign authorities do, that the names now adopted for our plants must not be considered as final.

The plant from Thirsk referred to by Warren ('Journ. Bot.' 1870, 170) as his var. *concinnus* belongs to *R. scabrosus*. A plant from Dr. White, found in Perthshire, is probably the *R. trigonodontus* of Boulay. It is also very like the example given by Wirtgen as *R. teretiusculus* Kalt.; but Focke places that plant amongst the *Glandulosi*, and therefore probably Wirtgen was in error. I believe the Perthshire plant is really *R. scabrosus* Müll.

52. (474) R. CÆSIUS γ. ULMIFOLIUS of my 'Manual' is, I believe, the *R. ligerinus* Génév., and that I erroneously referred to it under my var. *umbrosus*. Specimens from Naimby, Yorkshire (Baker, Aug. 12th, 1865), and from Twycross (Bloxam) are named *R. ligerinus* by Génévier. We thus get rid of an ambiguous name.

I have not yet been able to identify my var. *intermedius* with any foreign form.

R. cæsius ε. *hispidus* is retained on account of the ambiguity of the term *R. serpens*. My plant is apparently the *R. serpens* G. & G. and Génév., published in 1848, and perhaps the *R. corymbosus* Müll. of 1858; but not the *R. serpens* Weihe of 1831, which is the *R. feronensis* Müll. in the opinion of Focke, but separate from it in that of Génévier, who placed it close to *R. Bellardi*. I have not seen *R. feronensis* in Britain.

PS.—I have now (July 16th) much doubt of our *R. Grabowskii* being the same as *R. montanus*. It is certainly the *R. Grabowskii* of Génévier. A specimen from Baker (Boerby, Yorkshire, July 21st, 1864) may be the *R. montanus*. It is called *R. axillaris* Müll. by Génévier.

I have found a specimen of *R. hamosus* Gen., gathered at Doreton, Yorkshire (August 5th, 1865), and given as *R. cordifolius* to Déséglise by Baker, and by him to Génévier. It belongs to the first division of his *Discolores*, but seems to me, as Baker also believed, more nearly allied to *R. rhamnifolius*.

Baker's Surrey *R. thyrsoideus* is *R. nemophilus* Rip., according to Génévier.

NOTES ON JAPANESE DESMIDS. — No. I.

By John Roy and J. P. Bisset.

(Concluded from p. 196).

V. Staurastrum Meyen.

1. *S. Bieneanum* Rabenh. Junsai numa.

2. *S. orbiculare* (Ehrb.) Ralfs.

β. elevatum Nordst. Junsai numa.

γ. DEPRESSUM, new var.—Small, depressed. Long. 22 *μ*: lat. 20 *μ*; isth. 6 *μ*. Fig. 14. Junsai numa.

3. **S. globosum,** n. sp. — Large, one and a half times longer than broad; semicells nearly circular, with a very broad isthmus, constriction acute, opening very widely; vertical view triangular, with the angles very broadly rounded, and sides slightly concave. Membrane closely punctate. Long. 80–85 *μ*; lat. 55–57 *μ*; lat. of isth. 30–32 *μ*. Fig. 8.

Junsai numa.

A fine, large form, not closely related to any known species.

4. *S. corniculatum* Lundell. Junsai numa.

5. *S. leptodermum* Lundell. Junsai numa.

6. *S. brevispinum* Breb.

β. minor Rab. Long. 40 *μ*; lat. 34 *μ*; isth. 8 *μ*. Junsai numa.

7. **S. pseudocuspidatum,** n. sp. — Small, about one-third longer than broad, constriction deep, forming a nearly semicircular opening; semicells oval, terminated at each side by a short slightly incurved spine; end view triangular, the angles terminated by a straight spine, sides very slightly concave; isthmus long, opening very wide. Membrane minutely punctate. Long. 35 *μ*; lat., without spines, 27 *μ*; do., with spines, 35 *μ*; lat. of isth. 7 *μ*. Fig. 3.

Junsai numa.

8. *S. dejectum* Breb. Junsai numa.

β. apiculatum Breb. Junsai numa.

9. *S. connatum* Lundell (*S. dejectum*, *γ. connatum* Ldl.). Junsai numa. This form, common in many parts of the world, and always maintaining its distinctive characters, seems well entitled to rank as a distinct species.

β. RECTANGULUM, new var. — This var. differs from the type in having the sides very slightly convex instead of sharply rounded,

the opening rectangular, the spines stouter, and forming a continuation of the slightly curved sides in front view. Long., without spines, 20 μ; with spines, 37 μ; lat., without spines, 23 μ; with spines, 28 μ; isth. 7 μ. Fig. 12. Junsai numa.

10. *S. Dickiei* Ralfs. Junsai numa.

β. GRANULATUM, new var. — Differs from the type in being distinctly, though minutely, granular. Long. 33–38 μ; lat. 37 μ; lat. of isth. 12 μ. Junsai numa.

11. **S. oxyrhynchum**, n. sp. — Small; length and breadth equal, constriction deep, opening wide, sides of opening very rough, ends rounded, at the side angles a short stout spine pointing downwards; surface roughly rugose, with one or two curved rows of cleft verrucæ on the ends, giving them a strongly crenulated appearance; end view triangular, with straight sides, the angles terminated by the short spines, and the curved rows of verrucæ reaching from angle to angle. Isthmus one-third of the breadth of the semicell. Long. and lat. 30 μ; isth. 10 μ. Fig. 6.

Junsai numa.

12. *S. cuspidatum* Breb. Junsai numa.

13. *S. Avicula* Breb. Junsai numa.

14. *S. arcuatum* Nordst. Junsai numa.

15. *S. tunguscanum* Boldt (*l.* c. p. 114. Tab. v., fig. 22). Junsai numa.

16. *S. bifidum* (Ehrb.) Breb. Junsai numa.

17. *S. brachiatum* Ralfs. Junsai numa.

18. *S. dilatatum* Ehrb. Junsai numa.

19. *S. tricorne* Breb. Junsai numa.

20. *S. teliferum* Ralfs. Junsai numa.

21. **S. subteliferum**, n. sp. — Medium-sized, slightly longer than broad: semicells in front view regularly oval, with three stout spines on each side, 2–3 similar to and near to these on the face of the semicells, and two small spines close to the end; end view triangular, with three superposed stout spines terminating each angle, and two similar ones on each side of it; nearer the centre of the triangle is a circle of nine minute spines, sides concave; constriction acute, opening out widely. Membrane smooth. Long. 37 μ; lat. 35 μ; lat. of isth. 13 μ. Fig. 1.

Junsai numa.

This pretty species has a certain amount of resemblance to *S. teliferum* Ralfs, but differs essentially in the two sizes of spines, as well as in the form of the semicells. From *S. setigerum* Cleve (*S. Royanum* Archer), which also has spines of two sizes, it differs in being a third part smaller, in the form of the semicells, both in front and end view, and totally in the number and arrangement of the small spines.

22. *S. cristatum* Näg. Junsai numa.

23. *S. quadrangulare* Breb. Junsai numa.

24. *S. monticulosum* Breb. Junsai numa.

25. **S. submonticulosum**, n. sp. — Small, about as long as broad; semicell irregularly oval, with the end rounded, constriction shallow, at first straight, then abruptly rounded into a short stout

emarginate spine, with two very small teeth; slightly below the middle of each side; from these points round the end, the semicell is regularly oval, with four similar spines on the margin, two on each side of the end; there is one spine rather below the centre of the semicell, above this two, and still higher, close to the margin, other two spines; end view triangular, sides straight, abruptly contracted into the angles, which are terminated into a very short spine (acute in this view); on each side four spines disposed at equal distances, two at the contractions on the margin, the other two just within it. Membrane smooth. Isthmus half the breadth of the semicells. Long. and lat. 32 μ; lat. of isth. 14 μ. Fig. 7.

Junsai numa.

It seems unnecessary to compare this remarkable species with any other, though it is perhaps most nearly allied to *S. monticulosum* Breb.

26. *S. spinosum* Ralfs. Junsai numa.
27. *S. margaritaceum* (Ehrb.) Menegh.
β. hirtum Nordst. Junsai numa.
28. *S. polymorphum* Breb. Junsai numa.
29. *S. crenulatum* Näg. Junsai numa and Yokohama.
30. *S. aculeatum* (Ehrb.) Menegh. Junsai numa.
31. *S. vestitum* Ralfs. Junsai numa.
32. *S. gracile* Ralfs. Junsai numa.
33. *S. paradoxum* Meyen. Junsai numa.
34. *S. tetracerum* (Kütz.) Ralfs. Junsai numa.
35. *S. Arachne* Ralfs. Junsai numa.
36. *S. leptocladum* Nordst.
β. cornutum Wille. Junsai numa.
37. *S. inflexum* Breb. Junsai numa.

38. **S. subarmigerum,** n. sp.—Small, considerably constricted, opening, almost rectangular, ends convex; semicells with nine processes, about seven visible in front view, one at each angle, and two immediately above it, all directed slantingly upwards; processes nearly as long as the diameter of the semicell, emarginate, with two small teeth; end view triangular, with a long process, tipped with a spine at each angle, sides concave; from the raised end six similar but foreshortened processes, placed at equal distances, diverge radially, one on each side of the angles. Semicells and processes smooth. Isthmus half the breadth of the semicell. Long. excl. proc. 27 μ; lat. excl. proc. 23 μ; lat. of isth. 12 μ. Fig. 2.

Junsai numa.

The nearest ally of this species is *S. armigerum* Breb.; but it is not much more than half the size of that species, and is, besides, perfectly smooth.

39. *S. sexangulare* (Bulnh.) Lundell.

β. LÆVE, new var. — Smaller, processes shorter, lower turned a little downwards, upper nearly at right angles to the lower, 5-angled; ends smooth, without granules. Junsai numa. Differs from Nordstedt's MS. var. *productum* in the ends having no granules.

40. *S. Hantzchii* Reinsch. (*S. intricatum* Delponte). Junsai numa.

β. JAPONICUM, new var. — Larger, processes longer, and more slender. Long. incl. proc. 58 μ; lat. incl. proc. 50 μ; lat. isth. 24 μ. Fig. 5. Junsai numa.

41. **S. quadricornutum,** n. sp. — Small, semicells cuneate below, and rounded above; constriction, a rectangular opening with straight sides, terminated by two short emarginate processes; immediately over these are other two processes, on the end are two processes, and directly below these on the face of the semicell are other two; of the twelve processes on each semicell, usually not more than eight are visible at once; end view triangular, sides concave, angles cleft into four short processes, each tipped with a minute spine; of the four only two are visible at once, the other two being placed vertically underneath them. Isthmus about a third part of the breadth of the semicell. Membrane smooth. Long. 25 μ; lat. incl. proc. 30 μ; lat. isth. 10 μ. Fig. 4.

Junsai numa.

This species resembles *S. bifidum* (Ehrb.) Breb. in end view, but in front view it is entirely different, as it is from every other known species.

VI. XANTHIDIUM Ehrb.

1. *X. fasciculatum* Ehrb. Junsai numa.
2. *X. antilopæum* (Breb.) Kütz. Junsai numa.
3. **X. leiodermum,** n. sp. — Moderately large, about one-fifth longer than broad; semicells suboctagonal; constriction deep, acute, opening widely; base very slightly rounded to the lower angle, where there is one stout spine directed slantingly downwards so as almost to meet the corresponding spine on the other semicell; side to the next angle short, almost vertical, at the angle two stout slightly curved spines, slanting a little upwards; from this angle the semicell converges to the straight end; side straight, nearly as long as the end; at the upper angle a pair of stout straight spines, directed upwards not quite vertically. No central protuberance. Membrane smooth. Isthmus about one-third of the breadth of the semicell. Long. 48 μ; lat. 39 μ; isth. 11 μ. Fig. 11.

Junsai numa.

This species agrees with *X. cristatum* Breb. in the number and arrangement of the spines, but differs in the smooth semicells and the absence of a central circlet of granules; besides, the shape of the semicells is different in being suboctagonal, and not reniform at the base.

VII. CLOSTERIUM Nitzsch.

1. *C. striolatum* Ehrb. Junsai numa.
2. *C. Lunula* (Müller) Nitzsch. Junsai numa.
3. *C. acerosum* (Schrank) Ehrb. Yokohama.
4. *C. turgidum* Ehrb.

β. CURTUM, new var.—Smaller than the type, 6–7 times as long as broad. Long. 381 μ; lat. 57 μ. Junsai numa.

5. *C. lineatum* Ehrb. Yokohama.
6. *C. macilentum* Breb. Yokohama.
7. *C. Ehrenbergii* Menegh. Junsai numa.

8. *C. moniliferum* (Bory) Ehrb. Yokohama and Junsai numa.
9. *C. Dianæ* Ehrb. Junsai numa and Yokohama.
10. *C. Leiblienii* Kütz. Junsai numa.
11. *C. Venus* Kütz. Junsai numa.
12. *C. parvulum* Näg. Junsai numa.
13. *C. rostratum* Ehrb. Junsai numa. Yokohama, with zygospores.
14. *C. setaceum* Ehrb. Junsai numa.
15. *C. Kützingii* Breb. Junsai numa.
16. *C. pronum* Breb. Junsai numa.
17. *C. linea* Perty. Junsai numa.

VIII. Penium Breb.

1. *P. Digitus* (Ehrb.) Breb. Junsai numa.

IX. Docidium Breb.

1. **D. baculoides,** n. sp. — Slender, thirty-five times longer than broad, slightly constricted, ring not prominent; neither granules nor folds at the base, where there is a moderately prominent inflation, above which are 2–3 small undulations; breadth uniform from the basal inflation to the smoothly truncate apex. Long. of semicell 265 μ; lat. 15 μ. Fig. 18.

Junsai numa.

This species bears a considerable resemblance to *D. Baculum* Breb., from which it differs in the absence of granules or folds at the base, in the less prominent basal inflation, and in the undulations above it.

2. *D. Trabecula* (Ehrb.) Näg.

β. crassum Wittr. Long., semicell, 300 μ; lat. 75 μ. Junsai numa.

3. *D. maximum* Reinsch.

β. subclavatum Wittr. Long., semicell, 367 μ; lat., greatest, 64 μ; least, 30 μ. Junsai numa.

4. *D. indicum* Grunow. Long., semicell, 370 μ; lat. 28–46 μ. Yokohama and Junsai numa.

5. *D. crenulatum* (Ehrb.) Rab. Yokohama. Long., 495 μ; lat. at suture, 37 μ; do., at apex, 27 μ; do., greatest, 43 μ. Fig. 19. This species has very generally been associated with *D. nodulosum* Breb., to which it bears much the same relationship as *D. Ehrenbergii* Ralfs does to *D. Trabecula* Ehrb. The ring, which in *D. nodulosum* is prominent and acute, is here barely visible, being merely a slightly rounded swelling. Above the slight inflation at the base are 3–4 very shallow, rather long undulations. The apex is a little contracted, with about seven hemispherical granules around it, which barely show themselves over the margin, thus giving it a slightly crenulated appearance, which is probably often overlooked. Indeed this species appears to be more nearly related to *D. Archeri* Delponte than to *D. nodulosum*; but Delponte's species, besides being larger, is not *crenulated* at the apex.

X. Spirotænia Breb.

1. *S. condensata* Breb. Junsai numa.

XI. Onychonema Wallich.

1. *O. læve* Nordst.
   β. micracanthum Nordst. Junsai numa.
2. *O. filiforme* (Ehrb.); *Sphærozosma* Ralfs, &c.; *O. Nordstedtiana* Turner. Junsai numa. This species, so long considered a *Sphærozosma*, is evidently a true *Onychonema*. The glandular processes overlap the semicells precisely as in the case of *O. læve* Nord. and *O. uncinatum* Wallich. In this respect it agrees with all the specimens of supposed *S. filiforme* we have gathered in this country.

XII. Sphærozosma Corda.

1. *S. excavatum* Ralfs. Junsai numa.
2. **S. granulatum,** n. sp. — *S. spinulosum* Delp., according to Wolle, 'Desmids of the United States,' pp. 31 and 159, Pl. iv., fig. 14, and no doubt *S. excavatum* forma *Javanica* Nordst.—Small, as long as broad, constriction moderately deep, open; sides rounded, with 3–4 granules on each, ends straight, connecting glands widely separated; semicells from side view rounded, with six granules surrounding a central one; isthmus equal length of semicell. Long. 9 μ; lat. 10–11 μ; isth. 6–7 μ. Fig. 17.
   Junsai numa.
   Dr. Nordstedt has this species from New Zealand (*in lit. cum ic.*), and the authors have it from several localities in Scotland.

XIII. Desmidium Ag.

1. *D. Swartzii* Ag. Junsai numa.
2. *D. Baileyi* (Ralfs). Junsai numa.
3. *D. Aptogonum* Breb. Junsai numa.

Explanation of Plate 268.—Fig. 1. *Staurastrum subteliferum*, n. sp.; *a*, end; *b*, front; *c*, one side; × 400. 2. *S. subarmigerum*, n. sp.; *a*, end; *b*, front; × 400. 3. *S. pseudocuspidatum*, n. sp.; *a*, end; *b*, front; × 400. 4. *S. quadricornutum*, n. sp.; *a*, end; *b*, front; × 400. 5. *S. Hantzschii* Reinsch. *β. japonicum*, n. var.; *a*, end; *b*, front; × 400. 6. *S. oxyrhynchum*, n. sp.; *a*, end; *b*, front; × 600. 7. *S. submonticulosum*, n. sp.; *a*, end; *b*, front; × 600. 8. *S. globosum*, n. sp.; *a*, end: *b*, front; × 400. 9. *Cosmarium capitulum*, n. sp.; *a*, front; *b*, side; *c*, end; × 600. 10. *C. impressulum* Elfving; *a*, front; *b*, side; × 600. 11. *Xanthidium leiodermum*, n. sp.; × 400. 12. *Staurastrum connatum* Lund. *β. rectangulum*, n. var.; × 600. 13. *Micrasterias apiculata* (Ehrb.) Meneg.; × 200. 14. *Staurastrum orbiculare* (Ehrb.) Ralfs. *γ. depressum*, n. var.; *a*, end; *b*, front; × 600. 15. *Cosmarium decachondrum*, n. sp.; *a*, front; *b*, side; *c*, end; × 600. 16. *C. orthopleurum*, n. sp.; × 400. 17. *Sphærozosma granulatum*, n. sp.; × 1000. 18. *Docidium baculoides*, n. sp.; × 200. 19. *D. crenulatum* (Ehrb.) Rab.; *a*, × 200; *b*, × 400. 20. *Cosmarium fusum*, n. sp.; *a*, front; *b*, end; × 600.

A NEW TREE FERN FROM CENTRAL AMERICA.

By J. G. Baker, F.R.S.

In a small collection of ferns made lately by Mr. J. H. Hart, of the Jamaica Forest Department, in a trip to the lagoon of Chiriqui, is the following well-marked new species:—

Hemitelia (Amphicosmia) **Hartii**, Baker, n. sp. — Stipe 1½ ft. long, brown, channelled down the face, armed throughout with distant spreading pungent prickles and clothed towards the base with large lanceolate acuminate glossy brown paleæ. Lamina deltoid, tripinnatifid, moderately firm in texture, green and glabrous on both surfaces. Pinnæ oblong-lanceolate, 1–1½ ft. long, 3–3½ in. broad. Pinnules lanceolate, close, sessile, 2–2½ in. long, ½–⅝ in. broad, cut down to a narrow wing into linear-oblong obtuse crenate tertiary segments 1–12th in. broad. Veins very distinct, pinnate in the tertiary segments; veinlets 5–6 on a side, erecto-patent, simple or forked. Sori globose, superficial, medial on the veinlets; indusium unilateral, distinct, persistent, membranous, cucullate, not reaching to the top of the sorus, but subtending half of it.—Chiriqui lagoon, *Hart* 43! Allied to *H. multiflora* R. Br. (*H. guianensis* Hook.).

A NEW *ÆCHMEA*.

By J. G. Baker, F.R.S.

Æchmea (Platyæchmea) **chiriquensis,** n. sp.—Acaulescent. Leaves 5–6, in a dense rosette; dilated base oblong, 3–4 in. long; lamina lanceolate, a foot or less long, an inch broad, tapering to the point, thin and flexible, armed on the margin with spreading rather hooked, horny prickles, at most a line long. Peduncle slender, shorter than the leaves, furnished at the top with 3–4 spreading bright red scariose serrated bract leaves. Inflorescence two distichous oblong spikes 1–2 in. long; flowers 5–6 on a side, erecto-patent, crowded, each enclosed in a large striated oblong-navicular coriaceous bract ½ in. long. Ovary, including the sepals, just as long as the bract; sepals lanceolate-deltoid, coriaceous, with a small horny cusp, as long as the ovary. Petals protruded ⅛–⅙ in. beyond the sepals, narrow, obtuse. Stamens and style shorter than the petals.—Chiriqui lagoon, *Hart* 173! A very distinct novelty, nearest *Æ. tillandsioïdes* and *vriesioides* Baker, in Journ. Bot. 1879, p. 134.

SHORT NOTE.

Botanical Nomenclature.—In this Journal for June (p. 185), a list of names is given as being first published by Hudson, but the first two of these were published before Hudson's first edition. *Trifolium medium* was published by Linnæus, in his Nov. Fl. Suecica, issued as an appendix to the 2nd edition of his 'Fauna Suecica,' p. 558, which is dated 1761, one year previous to Hudson (1762). *Alopecurus bulbosus* was published in three volumes by different authors in the same year—Gouan (Hort. Monsp.), Hudson, and Linnæus (Spec. Plantarum, ed. 2, vol. i.). By comparison, I found that Gouan's preface was dated Jan. 9th, and Hudson's not dated, but issued before the Spec. Plant., which is dated Sept. 1st, and quotes Hudson. The authorities for these two species in the Lond. Catalogue are therefore presumably correct. I venture to think that much of the ignorance concerning Hudson's work must be due to the disparaging way in which he is quoted by Smith. I have never quite understood Smith's feeling towards him, but his animus is evident if reference be made to Smith's Eng. Flora, iii. 73, and if it be noticed how Hudson's names in "*Mentha*" are buried in a mass of synonymy, seemingly as to hide Hudson's merits. Many of the slipshod references to Linnæus have arisen from the exclusive use, until quite recently, of the second edition of the 'Species Plantarum.' Hence we find that Burman's *Geraniæ*, Jacquin's plants of 1760, Hudson's first edition, and Gouan's Hort. Monsp. are quoted as of Linnæus, through no fault of the last, who in each case is careful to cite his authority. Concerning this I have promised myself a long time to send some remarks, which I hope may not be much longer delayed.—B. Daydon Jackson.

[In this hope we heartily concur.—Ed. Journ. Bot.].

ADDITIONS TO THE BOTANICAL DEPARTMENT OF THE BRITISH MUSEUM DURING 1885.

By W. Carruthers, F.R.S.

During the past year 42,293 named and labelled specimens have been incorporated with the Herbarium. The phanerogamous plants have consisted chiefly of specimens collected in Austria by Kerner, in North Italy by Lojacono, in Syria by Post, in Turkestan by Regel, in India by Wallich and Beddome, in Japan, China, and Mandchuria by Maximowicz, in the Malayan Archipelago by Zollinger and Cuming, in Java by Blume, in Timor by R. Brown, A. Cunningham, and H. O. Forbes, in Australia by F. von Mueller, in Eastern Tropical Africa by Johnston, in Madagascar by Hilsenberg and Deans Cowan, in California by Greene and Jones, in Mexico by Wright, in the Expedition to Roraima by Im Thurn, in Brazil by Glaziou, and in Paraguay by Balansa, together with an extensive and valuable series, representing the species and varieties

of *Crocus*, and illustrating his monograph of that genus, presented by Mr. George Maw, and a large series of Grasses from various collections. The Cryptogams have been chiefly from the Herbarium of Mosses belonging to the late Dr. Hampe and from the Herbarium belonging to the late Dr. Dickie. The increase in the British Herbarium has been from presentations from British botanists, but chiefly from the collections of the Botanical Record Club which have been presented by that Society.

The most important addition to the collections during the past year was the purchase of Colonel Beddome's Herbarium of Indian plants, containing nearly 10,000 species, many of them being types.

George Maw, Esq., has presented his valuable collection of the genus *Crocus*, consisting of 416 specimens of plants and 72 specimens of corm-tunics, which are of special value in connection with Mr. Maw's important monograph of this genus. The specimens have been carefully mounted and incorporated with the Herbarium, and form an unsurpassed series of these interesting plants.

The other principal additions to the collections by presentation during the year have consisted of 743 species of plants from Australasia, from Baron von Mueller; 617 species of South African plants, presented by the Rev. W. Moyle Rogers; 337 species of plants from Morocco, from John Ball, Esq.; 315 species of plants collected in the Expedition to Roraima, British Guiana, from Everard F. im Thurn, Esq.; 114 species of plants, chiefly from South America, and four species of cultivated orchids from H. Veitch, Esq., F.L.S.; a small collection of plants from St. Mary Island, Gambia, from J. R. Maxwell, Esq.; 128 species of South African plants from J. Medley Wood, Esq.; 116 species of Indian plants from J. S. Gamble, Esq.; a small collection of plants from Aden, from Major Yerbury; 20 species of plants from the Falkland Islands, collected and presented by Mrs. Holmstead; some critical North American plants from Dr. Parry; a small collection of plants from the Gilbert Islands, from C. M. Woodford, Esq.; 150 species of plants from Greenland, from the Botanical Museum of the University of Copenhagen, through Prof. Kaierskou; 28 species of rare Italian plants from H. Groves, Esq.; a small collection of plants from Oporto, from I. Newton, Esq.; three species of Ceylon plants from Dr. Trimen; a species of *Crocus* and several *Algæ* from Afghanistan, from W. Simpson, Esq.; a collection of *Compositæ* from different parts of the world, from George Maw, Esq.; 10 specimens of *Nepenthes* and 14 specimens of *Masdevallia* from S. Courtauld, Esq.; 17 species of cultivated orchids from Baron Walter Rothschild; 50 species of cultivated orchids from Messrs. Shuttleworth, Carden, & Co.; 27 species of *Orchideæ* from Madagascar, collected by Dr. Fox; 10 species of cultivated orchids from T. Moore, Esq.; 3 species of cultivated orchids from T. Christy, Esq.; a cultivated orchis from B. S. Williams, Esq.; 4 species of cultivated orchids, from F. W. Burbidge, Esq.; a cultivated orchis, from Major Lendy; a species of *Eucharis*, from W. Bull, Esq.; a specimen of *Arthrotaxis laxifolia*, from J. Rashleigh, Esq.; 144 Cryptogams, from Mrs. Skipworth.

The following collections have been acquired by purchase; 914 species of plants from Paraguay, from Balansa; 2275 plants from South America, collected by R. Pearce; 400 Mexican plants from Kerber; 483 Mexican plants from Schaffner; 120 species of Californian plants, collected by the Rev. E. L. Greene; 344 plants from South Africa, being the beginning of MacOwan and Bolus's Herbarium Normale Austro-Africanum; 154 plants from Rubai Hills, Mombasa, collected by the Rev. W. E. Taylor; 453 species of plants from Comoro Islands, from Humblot; 282 plants from Syria, collected by Dr. G. E. Post; 1162 species of plants from Arabia, from H. C. Hart, Esq.; 300 specimens of European Hieracia, from Dr. Albert Peter; 100 species of Sicilian plants from Lojacono; 548 preparations of cellular plants made by W. Joshua, Esq.; 250 species of Diatomaceæ from Van Heurck; 165 species of American Hepaticæ; 200 species of European Fungi, from Rabenhorst; 100 species of Fungi, from Von Thuemen; 100 species of Ascomycetous Fungi, from Rehm; 100 species of European Mosses, from Rabenhorst.

The following important additions have been obtained by exchange for duplicates:—From the Imperial Botanical Gardens, St. Petersburg, 1072 species of plants from Japan, China, and Mandchuria, collected by C. J. de Maximowicz, and 663 Turkestan plants, collected by Alb. de Regel; from the Royal Herbarium, Leyden, 355 species of plants from Java, collected by Blume and others; from J. F. Duthie, Esq., Director of the Botanical Gardens, Saharunpore, India, 350 plants from Kumaon, and other parts of Northern India, collected by Mr. Duthie; from Professor Engler, of the University of Kiel, 100 species of *Aroideæ*; from R. D. Fitzgerald, Esq., of Sydney, 8 species of Australian orchids; and from the Imperial Herbarium, Vienna, 593 Austro-Hungarian plants, collected by Dr. A. J. Kerner, Professor of the University of Vienna. Seventy specimens of *Corallineæ* have been transferred from the Department of Zoology.

Contributions to the British Herbarium have been received from R. F. Towndrow, Esq., J. C. Mansel-Pleydell, Esq., J. Benbow, Esq., G. S. Boulger, Esq,, Rev. D. Matheson, W. Mathews, Esq., W. Bowles Barrett, Esq., R. Sherring, Esq., Rev. C. A. Newdigate, A. Bennett, Esq., J. H. A. Jenner, Esq., J. Brebner, Esq., W. H. Beeby, Esq., J. E. Griffith, Esq., Dr. Fraser, R. Brown, Esq., F. J. Hanbury, Esq., J. Rashleigh, Esq., and H. G. Glasspoole, Esq. From F. A. Lees, Esq., has been received the parcel of plants presented by the Botanical Record Club. A collection of the fruits and seeds of 210 British plants, from Clement Reid, Esq.; 129 species of Mosses collected in Bedfordshire, by Mr. J. Saunders; 2 Liverworts from F. T. Mott, Esq.; 25 *Algæ* from E. M. Holmes, Esq.; 12 Fungi from W. G. Smith, Esq.; and preparations showing the oospores of *Peronospora pygmæa*, from Geo. Brebner, Esq., have also been received.

The collection of the prints and drawings of plants has also been increased by the purchase of 174 original drawings of the plants of the Straits Settlements made by Christopher Smith,

whose collections are in the Herbarium; 70 original drawings by Spaendonk; 32 original drawings of Fungi, by W. G. Smith; 1415 plates of plants. Dr. M. C. Cooke presented 281 plates of British Fungi, from works published by him on these plants.

NOTICES OF BOOKS.

Sylloge Fungorum omnium hucusque cognitorum. Vol. iv.—Hyphomycetes. Prof. P. A. Saccardo. Patavii, 1886.

This volume of Prof. Saccardo's grand work, the progress of which is being anxiously watched by all the mycologists of the world, is as great a triumph as any of the three that have preceded it. The group of Fungi of which it treats is one of the most difficult to arrange; and those who have waded through the curious mixtures of unlike species presented to us in the pages of Bonorden, Corda, Fries, and others, will be grateful to the author of the most successful attempt to classify the Hyphomycetes according to their true affinities.

The old Friesian system, which is now at its last gasp in England, its last retreat, committed in regard to this group one cardinal and fatal error. The Thread-Fungi were defined as those in which the hyphæ were a conspicuous feature. But it was obvious to anyone who examined a number of species that a perfect and gradual series could be traced from forms in which the hyphæ were most prominent, as in *Helminthosporium*, through forms in which they became less and less obtrusive, down to those, as in *Sporodesmium*, in which they seemed hardly to exist at all; in the latter of course the conidia alone remained (an evanescent mycelium excepted) to constitute the fungus. The writers who have been mentioned ignored this transition, and placed the latter forms in a distinct group, to which the name of *Coniomycetes* was given. But unfortunately they placed with them in the *Coniomycetes* a most various and strangely heterogeneous agglomeration of forms, of which it could be truly said that the absence of conspicuous hyphæ was the only bond of union. The idea of uniting such genera as *Phoma*, *Torula*, and *Puccinia* in the same family could only be entertained by one who looked most superficially at the merest accidents of external form. But it is well known that Fries felt somewhat of a contempt for these lowly Fungi, and his ungenerous treatment of Corda, who made them his special study, may perhaps have been due in part to this feeling.

If the microscopist examines such a species as *Sporodesmium abruptum*, and compares it with *Helminthosporium stemphylioides*, he must acknowledge that, so far from their being placed in distinct families or orders, there is scarcely sufficient reason for placing them in separate genera. Nearly so is it with some species of *Torula* and *Oidium*; the difference of colour and texture may be sufficient warrant for dividing them, but to place them wide apart is to break the most elementary axioms of taxonomy. Yet this is

what was done by Fries, and English mycologists have religiously followed his example. It is idle to say that they have now relinquished this practice, for it is possible to point to even recent cases in which the old illogical distinction between the Torulacei and the Hyphomycetes is maintained.

In the final abolition of this distinction we have the key-note of Prof. Saccardo's plan. Taking the *Hyphomycetes* in this widened sense, he divides them into four main groups,—or, as he calls them, families,—each of which is subdivided, in his usual and now so universally approved plan, according to the septation of the conidia. It may not be amiss to express a regret, in passing, that the use of the term "natural order" seems to be unanimously avoided by all cryptogamists, without any compensating advantages.

The first family, *Mucedineæ*, includes those species that have the hyphæ distinct, *i. e.*, not densely fasciculate, and of a light or brilliant colour, with the usual accompanying thinness of texture. The second family, *Dematieæ*, includes those that differ from the first in their dark brown or blackish colour, and the usual concomitant density of texture, which is often described as "carbonaceous." This mode of division is convenient, and has the sanction of previous writers; yet it is by no means certain that it is one which will stand the test of future experience. For though in certain cases the distinction is clearly natural, yet in others it separates too far species which are closely allied.

In the third family, *Stilbeæ*, are placed those species of which *Isaria* and *Stilbum* may be taken as the type; and in the fourth, *Tuberculariеæ*, those typified by *Fusarium* and *Tubercularia*. Each of these families includes two series; one bright-coloured, resembling the *Mucedineæ*, the other brown and resembling the *Dematieæ*.

In all these families 3583 species are recorded. Some already described are accidentally omitted, but, on the other hand, many of those enumerated will afterwards prove not to be distinct from others. *Helminthosporium capitulatum*, e. g., is probably only *Acrothecium tenebrosum*, and *H. truncatum* is badly observed *Sporoschisma mirabile*. A more curious instance is found in *Penicillium Hypomycetis* Sacc. (p. 80), which is the same species that the author has himself already described as *P. socium* Sacc. (Syll. ii. 468, 1883). Many of the repetitions will be found to be due to the curt descriptions which some authors preferred to give of their discoveries.

In criticising Prof. Saccardo's work it must never be forgotten that his primary object is utility; and some of the arrangements are adopted merely for this purpose, and not because they are in themselves justifiable. A good instance of his mode of treatment is found in *Coremium*; the species which have been described under this name are collected together, not because the author believes that *Coremium* is a genus distinct from *Penicillium*, but, "*facilioris studii causa*," because it is impossible as yet to refer every species of the former to its proper place in the latter.

W. B. Grove.

The Flora of Oxfordshire: being a Topographical and Historical Account of the Flowering Plants and Ferns found in the County, with Sketches of the Progress of Oxfordshire Botany during the past three centuries. By GEORGE CLARIDGE DRUCE. Parker & Co.: Oxford and London. 1886. 8vo, pp. lii. 451.

No one acquainted with British botanical literature can open this latest addition to our county floras without being struck by the striking resemblance which it bears to the 'Flora of Middlesex.' Whether this is intentional or accidental—and it seems too close to be the latter—Mr. Druce is sure to be the gainer by it. The intrinsic worth of the 'Flora of Middlesex,' apart from the original line which it struck out, will always entitle it to a high place among our local floras; and one is insensibly prejudiced in favour of a book which at once calls to mind in manner and method an earlier work of acknowledged excellence. We are more influenced than we think or, perhaps, would care to admit, by the external details of print, arrangement, and paper; and many a book, by the aid of these adjuncts, has attained a position to which its internal merits would not entitle it, just as many a valuable contribution to literature has been damaged by the want of attention to such details.

This resemblance between the floras of Middlesex and Oxford is, however, by no means confined to externals. In the latter we have the same harmonious combination of personal work and bibliographical research which distinguished the former; and if Mr. Druce cannot claim with Messrs. Trimen and Dyer the establishment of a new model for books of the kind, his volume will do good service in keeping before the eyes of the new generation of British botanists the lines in which they should work.

The introduction of some fifty pages, after a useful and modest Preface, is devoted to the topography, geology, botanical districts, based upon the river drainage (the principal places and plants in each being enumerated), and meteorology; followed by the plan of the flora, with lists of books, herbaria, and botanists consulted. Then comes the flora proper.

Under each species are given references to 'Topographical Botany,' Baxter's 'Phænogamous Botany' (an Oxford book), Nyman's 'Conspectus,' and the 3rd edition of 'English Botany.' The nomenclature and arrangement is essentially that of Nyman, "to which, however, slavish adherence has not been kept." We could wish that Nyman had been followed in his retention of the genus *Batrachium* for the aquatic *Ranunculi*, especially as Mr. Druce has followed him in separating as genera *Pulsatilla*, *Githago*, and others, whose claims to distinction are certainly no greater. We are glad to note that many of the earlier names to which attention has been called in these pages have been employed by Mr. Druce; in this manner, and with the aid of the new 'London Catalogue,' our nomenclature will undergo a peaceful revolution, and the correct designations will gradually but surely make their way into ordinary botanical literature. We have always protested

against the notion that any special honour was conferred upon a man by having his name attached as the authority for a species; but we are nevertheless pleased to see Dr. Beeke's name appearing in our lists in connection with *Lotus pilosus* (*L. major* Sm.), which he was the first to distinguish specifically from *L. corniculatus*. It is desirable, however, to use only one name for the same plant; we find *Ranunculus Sardous* on p. 398 and *R. hirsutus* on p. 370.

One small point on which a word of criticism may be offered is that of the abbreviation of authorities. We have always felt that the only satisfactory way of doing this, when it is really necessary, is by giving the first syllable in full and the first letter (or two letters) of the second; and this is the plan recommended by DeCandolle. Mr. Druce is by no means singular in not adopting this plan, but our books would gain in consistency and uniformity if it were generally followed. Initials might always (save in the rare instances of two botanists having the same surname) be omitted, and names of one syllable given in full. The extra space required in the latter cases would be more than counterbalanced by that gained in the former, as may be seen if for "W. T. Dyer," "H. Bos." and "Sib.," "Dyer," Bosw." and "Sibth." be substituted. And there should only be one way of referring to the same persons and books. Mr. Druce quotes Alfred French as "A. Fr.'" "Fr." and "H. A. F." (Herb. Alf. French); and his citations of the same work vary a good deal.

The abbreviations of generic and specific names—e.g., "*Tarax. erythrosp.*, *Potam. zosterifol.*—which we find in the summary, seem to us very unsightly; only custom or a material saving of space could justify them, and neither plea can be put forward, although the Royal Society, in its Proceedings, some few years back set a dangerous precedent. We think, too, the placing of the authority *before* the passage cited, as is done in the paragraphs devoted to "First record," is an undesirable deviation from the plan of the 'Flora of Middlesex,' especially as there are no quotation marks to indicate the citation. There is, indeed, a good deal of inconsistency in the use of quotation marks throughout the book, and it is not always easy to determine whose statement we are reading,—as, for example, in the localities and notes under *Pyrola minor*.

Besides the mere enumeration of plants and localities, there are many items of general information which indicate careful observation on the part of the author, and also, in some cases, we think, a want of concentration, which is perhaps due rather to an absence of literary skill than to any uncertainty as to what is intended by the writer. One of the most noteworthy is the series of notes upon the Oxford Senecios of the *squalidus* set. It is to be regretted that many of these are in the Appendix, and thus liable to be overlooked; this reference, however, may help to prevent this. According to Mr. Druce—and no one has more favourable oppportunities for investigating the matter—there are at Oxford four varieties of *Senecio squalidus*:—"Var. a. *incisus*, Guss!: var. b. *chrysanthemifolius* Guss!: ? var. c. *microglossus*, ? *parviflorus* Dyer,:

var. *hybrida* = vulgaris × squalidus!" * Besides these, two species, "*S. crassifolius* W." and "*S. vernalis* W. & K." are also given, with a note that "probably *S. leucanthemifolius*, Poir." should be added to the list. Mr. Druce thinks that all these, with four other continental species, are hybrids of *vulgaris* and *squalidus*. This seems to us likely enough, so far as the Oxford plants referred to are concerned; but a careful consultation of types would be necessary before any such generalisation as to the species could be satisfactorily established. Meanwhile, if a debt of gratitude is due to him who makes two blades of grass grow where one grew before, surely British botanists will thank Mr. Druce for having thus amplified *Senecio squalidus!* Perhaps he may see his way, after a careful comparison of types, to embody his observations in a paper for this Journal. The note on *Gentiana germanica*, *Phragmites communis*, and *Orchis Simia* are interesting. The list of Mosses is very full; that of *Rubi* seems scanty, and gives us the impression that Mr. Druce is not quite familiar with this troublesome group; it would have been well had the venerable Professor of the sister University been induced to take it in hand. Of *Thlaspi perfoliatum* Mr. Druce says, "A few plants from time to time have been found on Cumnor Hill, Berks; these owe their origin to a quantity of seed scattered by Messrs. Boswell and Holliday about 1860"—a most reprehensible act.

There seems a little over-partiality for the insertion of aliens and doubtful characters: *Cytisus Laburnum*, "frequent as a planted tree," *Sorbus fennica*, "planted," *Quercus Ilex* and *Q. Cerris*, "in parks and plantations," *Inglans regia*, "as a planted tree," and the like, would have been better omitted. The record of *Phleum asperum* as an Oxfordshire plant is traced to its source in the Botanic Garden, and one or two other errors are run to earth.

The "Summary" would have been more useful had the tabular form, contrasting the flora of Oxford with that of the surrounding counties, been adopted. The Flora of Bucks is, as Mr. Druce says, very imperfectly known; but one of the plants which he says are "found in Berks alone of the border counties" is naturalised therein, *Verbascum Lychnitis*. We have little doubt that Mr. Druce is right in considering *Helleborus viridis* as native in Oxfordshire as it is in Bucks, and of this no one who has seen it growing in the woods and hedge-bottoms about High Wycombe will have any doubt; and it is, we think, equally certain that *H. fœtidus* is native in Gloucestershire, though he does not mention it for this border county.

The biographical notes are remarkably well done, and give much interesting information regarding the Bobarts, Morison, Sherard, Dillenius, Sibthorp, Baxter, and Walker, whose names are intimately associated with Oxford botany: there is also a sympathetic little sketch of Alfred French, whose share in collecting much of the material on which the Flora is based is fully acknowledged by Mr. Druce. We had hoped to have learnt something of the Rev.

---

* We cite these names exactly as printed: we do not quite understand Mr. Druce's use of the sign "!."

Littleton Brown, who helped Dillenius in preparing the 'Historia Muscorum,' and is styled by Sherard "the keenest botanist I have met with; he hath an excellent eye."* Mr. Druce mentions him as having joined Dillenius and Brewer in Shropshire (of which county he was a native), but his connection with Oxfordshire botany was probably too slight to entitle him to a more extended notice.

Mr. Boswell contributes a valuable Appendix devoted to the Mosses and Hepaticæ; and there are also lists, admittedly very incomplete, also of Fungi and Lichens.

The list of corrections, large as it is, is not exhaustive: on p. 281 "Napford" should be "Naphill"; M. Gandoger's initial is "M." not "Cl." (p. 1); Mr. Melvill's name has no final e; and others might be cited.

Illustrations of British Fungi (Hymenomycetes). To serve as an Atlas to the 'Handbook of British Fungi.' By M. C. Cooke, M.A., LL.D., A.L.S. Vols. I., II., III., and IV. 8vo. Williams & Norgate. London, 1881–1886.

The delineation of the higher fungi may be governed by two different purposes, artistic effect and technical accuracy. The first may be attained where the second does not exist, or *vice versâ;* but the great desideratum is the combination of the two, a result rarely achieved. The number of works illustrating British species are not numerous; yet we can point with pride to Bolton, Sowerby, Greville, and Hussey, whose figures stand in the first rank of excellence, bearing comparison with Bulliard's amongst French, and Corda's amongst German authors. Although these works attain the standard of artistic merit, they are not equal in rendering technical details, and some are unaccompanied by the necessary descriptions. Sowerby's figures are admirable, while his descriptions are most provokingly inadequate. The small number contained in Greville's 'Scottish Cryptogamic Flora' are equally good, and are fully described, and it is a lasting subject of regret the work was never completed owing to want of support. The figures in Mrs. Hussey's expensive work display great artistic merit, with considerable care in giving details, but the work as a whole is more suggestive of the drawing-room than the study. 'Berkeley's Outlines' contains ninety-two excellent figures of the Agaricini by W. Fitch, and Saunders and Smith's 'Mycological Illustrations' contains fifty-nine superior figures. This last-named work, like that of Greville, came to an untimely end on the completion of the second part. These, with the addition of a small work by Mrs. Price, having no sections, complete the list of British authors whose works in this department deserve mention, some of them being scarce and expensive, while the others are utterly inadequate to meet the wants of the time. It is obvious, therefore, that the work whose title stands at the head of this notice could not have appeared more opportunely or been less in fear of rivalry.

---

* Richardson's 'Correspondence,' 233.

The field is absolutely clear, for we take no note of foreign works which have no special regard to our own flora. How far it worthily occupies the ground we shall presently see.

In no branch of Botany are figures more indispensable than in the study of the higher fungi. The specific characters in many instances are of such a delicate nature and so exceedingly evanescent that they defy all efforts to preserve them in the herbarium, while much careful practice and a long experience are required on the part of the student to enable him safely to interpret verbal descriptions of them, however precise they may be. The late Dr. Klotzsch's method of preserving Agarics and *Boleti*, described in the fifth volume of the 'English Flora,' has never been improved upon, and, if patiently and carefully carried out, will greatly assist in retaining some memorial of a species; yet it cannot be questioned that after all is done specimens so preserved do not supersede the necessity for good figures. Take the genus *Cortinarius*, for example, with its fleeting colours of yellow, brown, and purple, its veils, now arachnoid now glutinous, its variable pilei clothed with fugaceous squamules or delicate innate silky fibrils, which no words can depict, and an overwhelming case is made out in favour of figures. It is well, therefore, for the present race of mycologists, of whom the number is daily increasing, that Dr. Cooke has come forward to produce such a work as this. With several failures to bring to completion enterprises of a like kind before him, it argues no small amount of courage to undertake it, and we sincerely hope he will meet with the success he deserves. It is with unfeigned astonishment we read in the Introduction "that less than seventy of the inhabitants of the British Islands contribute, as subscribers, to its success, and its very existence is consequently dependent upon foreign support"! We venture to say that a statement more discreditable to a people professing an admiration of science could hardly be made.

These four volumes contain 622 coloured lithograph plates, some of which have two, more rarely three, species or varieties on them; making a total of 757 species, exclusive of varieties. This is a larger number than is contained in the whole of the English works referred to above. The cordial co-operation of the more active British mycologists in sending specimens and drawings has largely contributed to this result, which help the author honourably acknowledges. The initials of the Rev. M. J. Berkeley, and his daughter, Miss Ruth Berkeley, Mr. Broome, the late Dr. Bull, Mr. Worthington Smith, and others, show how generously drawings have been placed at his disposal. Indeed no one man could possibly accomplish such a work without this co-operation, for it falls to the lot of few to see living specimens of all the species here figured.

As to the execution of the figures, we are pleased to be able to say that they display great attention to the specific features necessary for identification, and their artistic merit is much above the average: the colouring is in the main truthful, and where any slight defect of hue can be detected it is no doubt owing to the difficulty inherent in colour-printing by lithography. A novice

could hardly fail with this work in his hands to recognise the species he may find in his country rambles, especially if he will carefully compare the descriptions which are issued concurrently in the pages of 'Grevillea.' We sincerely hope this work will yet meet with the support it deserves, and that its energetic and able author may see its satisfactory completion. If all our professors of Botany and all our public libraries possessed themselves of a copy, this result would be secured. WILLIAM PHILLIPS.

THE Index number of 'English Botany' has just been issued, forming a companion to the whole work, to which it is a useful adjunct. Its bulk might have been materially lessened, and its usefulness in no way diminished, by the omission of the greater part of the so-called English, French and German names. It is about as likely that any Frenchman ever called *Meconopsis* "Méconopside des Galles" as it is that any sane Englishman would call *Rubus thyrsoideus* the "Thyrsus-flowered Bramble," or *Carex depauperata* the "Starved Wood Sedge"; and this is very unlikely indeed. Mr. N. E. Brown has "undertaken the arduous work," and we regret that his valuable time has been spent to so little purpose. We fear, from the issue of this Index, that the much-needed Supplement to the whole work is not likely to appear at present.

DR. M. C. COOKE has issued the first number of 'British Desmids: a Supplement to British Fresh-water Algæ'; it contains 16 pages of letterpress and 8 plates.

NEW BOOKS.—G. KRABBE, 'Das gleitende Wachsthum bei der Gewebebildung der Gefässpflanzen' (Berlin, Eggers: 4to, pp. vii. 100, tt. 7.) — D. MAEDER, 'Der Wald in seiner kulturhistorischen und naturgeschichtlichen Bedeutung' (Devos, Richter: 8v, pp. 96).—A. KNENCKER, 'Führer durch die Flora von Karlsruhe' (Karlsruhe, Reiff: sm. 8vo, pp. v. 167).—L. QUÉLET, 'Enchiridion Fungorum in Europa media et præsertim in Gallia vigentium' (Paris, Doin: 8vo, pp. viii. 352).—J. DULAC, 'Mélanges botaniques: plantes nouvelles, critiques, monstrueuses, ou rares' (Paris, Savy: 8vo, pp. xxiii. 484).—W. MEIGEN, 'Flora von Wesel' (Wesel, Kühler, 8vo, pp. viii. 44).—F. G. KOHL, 'Die Transpiration der Pflanzen' (Baurnschweig, Bruhn: 8vo, pp. 22, tt. 4).—A. VOCKE & ANGELRODT, 'Flora von Nordhausen und der weiteren Umgegend' (Berlin, Friedländer: 8vo, pp. viii. 332),—K. HUBER & A. BEECKER, 'Pathologish-Histologischen und Bacteriologischen Untersuchungs-Methoden' (Leipzig, Vogel: 8vo, 122, 1 tab.).

ARTICLES IN JOURNALS.

Botanical Gazette (June).—'Herbarium Number.'*

Bot. Zeitung (June 11–July 9). — A. de Bary, 'Ueber einige

* A very useful number, which we hope to see reissued separately. It contains numerous articles on 'Specimens and Specimen making,' and 'How to collect certain plants,' by practised hands, abounding with useful hints and suggestions.

Sclerotinien und Sclerotienkrankheiten.'—(July 16). W. Wahrlich, 'Beitrag zur Kenntniss der Orchideenwurzelpilze' (1 plate).

Bull. Bot. Soc. Belg., XXV. (July 1).—E. de Wildeman, 'Note sur les deux espèces terrestres du genre *Ulotrix*' (1 plate).—J. Cardot, 'Les Sphaignes d'Europe' (2 plates). — V. Mouton, 'Ascomycètes observés aux environs de Liége' (1 plate): many new species). — E. Bommer & M. Rousseau, 'Contributions à la flore mycologique de Belgique.'

Bull. Soc. Bot. France (XXXIII. Comptes rendus 3; July 1).— —. Copineau, 'Dessiccation des plantes en voyage.' — E. Mer, 'Modifications de structure subies par une feuille de Lierre enracinée.' — J. d'Arbaumont, 'Note sur le Péricycle.' — P. van Tieghem, 'Transpiration et Chlorovaporisation.' — N. Patouillard, 'Deux genres nouveaux de Pyrénomycètes' (*Cylindrina*, *Pyrenotheca*). — P. Duchartre, 'Sur les vrilles des Cucurbitacées.' — E. Mer, 'Influence du milieu sur la structure des plantes amphibies.' — L. Courchet, 'Sur les chromoleucites des fruits et des fleurs.'— P. van Tieghem et H. Lecomte, 'Structure et affinitées du *Leitneria*.' — L. Mangin, 'Recherches sur les bourgeons.' — P. Duchartre, 'Monstruosité de la Primevère.'—E. Belzung, 'Formation d'amidon pendant la germination des sclérotes.' — A. Franchet, 'Existence du *Cypripedium arietinum* dans le Yun-nan.' — L. du Sablon, 'Influence des gelées sur la sève.'— P. van Tieghem et H. Douliot, 'Sur les tiges à pleusieurs cylindres centraux.'— P. van Tieghem, 'Inversion du sucre de Canne par le pollen.'

Bull. Torrey Bot. Club (June). — N. L. Britton, 'Leaf-forms of *Populus grandidentata*' (1 plate).— P. H. Dudley, 'Duct Formation in Chestnut Wood.' — (July). N. Pike, 'Check List of Marine Algæ.' — G. Nasey, 'New Grasses' (*Trisetum montanum*. *Diplachne Reverchoni*, *Festuca texana*, *Elymus Macounii*, *E. nitidus*, spp. nn.).— C. Müller, *Orthotrichum Pringlei*, n. sp.

Flora (May 21). — E. Röll, 'Zur Systematik der Torfmoose.'— (June 1, 11).—K. F. Jordan, 'Die Stellung der Honigbehälter und der Befruchtungswerkzeuge in den Blumen.'—(June 1, 21, July 11). J. Müller, 'Lichenologische Beiträge.' — (June 21). C. Müller, 'Bryologia insulæ S. Thomé Africæ occid. trop.' (many new species). — (July 1). A. Hausgirg, 'Zur Kenntniss einzelliger Bildungen der Moosvorkeime nebst einigen Bemerkungen zur Systematik der Algen.'—H. Karsten, 'Ameisenpflanzen.'—(July 11). W. Nylander, 'Lichenes insulæ Sancti Pauli' (many new).

Garden (June 19). *Aristolochia elegans* Mast. (ic. pict.).

Gardeners' Chronicle (June 12). — *Selaginella gracilis* T. Moore, n. sp.— *Impatiens Hawkeri* Hort. Bull. (fig. 168). — W. G. Smith, *Peronospora viticola* (fig. 169). — (June 19). J. D. Hooker, *Abies Webbiana*) figs. 174, 175). — W. G. Smith, *Glœosporium lœticolor* (fig. 177).—(June 26). *Karatas amazonica* Baker, *Aerides Godefroyanum* Rchb. f., spp. nn. — W. G. Smith, *Phycomyces splendens* (fig. 184). — (July 3). J. G. Baker, '*Gunnera manicata*.' — J. H. Hart, 'Self-fertilisation of *Epidendrum varieyatum*.'—H. N. Ridley, 'Nomenclature of Orchids.' — (July 10). *Albuca corymbosa* Baker,

Tritonia Wilsoni Baker, spp. nn. — (July 17). *Dendrobium percnanthum* Rchb. f., *Vanda Lindeni* Rchb. f., spp. nn. — W. G. Smith, '*Coleosporium pingue*' (figs. 15–18). — (July 24). *Masdevallia striatella* Rchb. f., *Chondrorrhyncha Lendyana* Rchb. f., spp. nn.

Journ. Linn. Soc. xxiii., No. 151 (July 23)—F. B. Forbes & W. B. Hemsley, 'Index Floræ Sinensis,' pt. ii. (*Impatiens furcillata*, *I. plebeja*, *I. tubulosa*, *Psilopeganum* (gen. nov., *Rutaceæ*) *sinense* (t. iii.), *Zanthoxylum dissitum*, *Z. podocarpum*, *Z. setosum*, *Ilex ficoidea*, *Euonymus carnosus*, *E. gracilimus*, *Celastrus latifolius*, *C. variabilis*, *Rhamnus rugulosa*, *Vitis Henryana*, *V. pachyphylla*, *V. umbellata*, *Sabia Swinhoei*, *Melioma Fordii*, *M. patens*, *Fordia* (gen. nov., *Leguminosæ Millettiæ*) *cauliflora* (t. iv.), spp. nov.; all of Hemsley. —(xxii. 145, July 23). E. Bonavia, 'Probable Wild Source of the cultivated true Limes' (*Citrus acida*). — J. S. Gardner, 'Fossil Leaves from Isle of Mull.' — J. G. Baker, 'Ferns collected in N. Borneo by the Bishop of Singapore' (*Trichomanes Hosei* (t. xii.), *Dicksonia ampla*, *D. gomphophylla*, *Asplenium æquibasale*, *Nephrodium sarawakense*, *N. aciculatum*, *N. multisetum*, *N. megaphyllum*, *N. stenophyllum* (t. xi.), *Polypodium sarawakense*, *P. campyloneuroides*, *P. leucophorum*, *Meniscium Hosei*, *Acrostichum stenosemoides*, *A. modestum*, *A. antrophyoides*, spp. nn.). — H. N. Ridley, 'Freshwater Hydrocharideæ of Africa and its Islands' (*Lagarosiphon Nyassæ*, *L. rubella*, *L. densus*, *Blyxa radicans* (t. xiv.), *Ottelia vesiculata*, *O. plantaginea*, *Boottia crassifolia*, *B. abyssinica*, *B. exserta* (t. xiii.), spp. nn.—Id., 'Monograph of the Genus *Liparis*' (*L. platyphylla*, *L. Beddomei*, *L. xanthina*, *L. pectinata*, *L. Forbesii*, *L. lacerata*, *L. Beccarii*, *L. Griffithii*, *L. Hookeri*, *L. resupinata*, *L. Cumingii*, *L. clavigera*, *L. triloba*, spp. nn.: 110 species in all).—W. Mitten, 'New Species of *Metzgeria*' (*M. saccata*, *M. scobina*, *M. nitida*.)

Midland Naturalist (June). — H. Boyden, 'Flora of the Rea Valley.'—W. B. Grove, 'Fungus-hunting in Spring.'

Nuov. Giorn. Bot. Ital. (July). — A. Goiran, 'Prodromus Floræ Veronensis' (contd.).—F. Tassi, 'Su delle singolari anormalità dei fiori dell' *Emilia sagittata*.' — F. Baglietto, 'Primo censimento dei funghi della Liguria' (*Agaricus cognatus*, *A. luteo-cæsius*, spp. nn.). —A. Piccone, 'Piante disseminate da uccelli.'

Oesterr. Bot. Zeitschrift (July). — Biography of G. Strobl (b. 1846; portrait). — J. Velenovsky, 'Flora von Ost. Rumelien.' V. v. Borbás, '*Coronilla emeroides*.'

Pharmaceutical Journal (June 19).—W. Kirkby, 'A Contribution to the knowledge of the Venezuela Sandalwood tree.'

OBITUARY.

With much regret we have to announce the death of Dr. H. F. Hance, one of the oldest and most valued contributors to this Journal, and one of its warmest supporters. The sad event took place at Canton on June 22nd. Mr. F. B. Forbes has kindly undertaken to write a biographical sketch of Dr. Hance, which, with portrait, will appear in an early issue.

Structure of Lathrea squamaria.

ON THE STRUCTURE AND FUNCTIONS OF THE SUBTERRANEAN PARTS OF *LATHRÆA SQUAMARIA* L.

By George Massee, F.R.M.S.

(Plate 269).

In the year 1829 Mr. J. E. Bowman presented to the Linnean Society * a detailed description of the structure of this interesting plant, which he considered to be a true parasite; obtaining its food from the roots on which it is parasitic, by means of tuberous discs developed on its fibrous rootlets. The minute structure of the scale-like leaves is described, the glandular internal cavities being supposed to contain air, from which the glands absorbed carbonic di-oxide, and consequently the physiological equivalents of stomata, the morphological differences observable between these subterranean and aërial leaves being attributed to the different conditions under which they existed. In accordance with this assumed similarity of function the author considered these organs to be true leaves, and not roots, as stated by previous writers. "It will not, I think, be contended that they absorb *moisture* rather than *air*; and as this forms the grand distinction between *roots* and *leaves*, I trust I have satisfactorily proved them to be the latter." † The very large starch grains appear to have puzzled the author, who describes them as "perfectly transparent bladders," tried many curious experiments with them, and adds that similar bodies are met with in the bulbs of *Lilium candidum* and *Narcissus*.

In later times the structure and functions of the scale-leaves have been investigated by W. H. Gilburt, ‡ who describes two kinds of gland in the leaf cavities. He considers the stipitate glands as performing both secretory and absorbent functions, and concludes that the plant is only partially parasitic. We have met with the plant parasitic upon elm, ash, hazel and beech, on the first most frequently, on the last-mentioned once; and recently it was pointed out growing abundantly under rhododendron bushes in Kew gardens, from the roots of which it presumably derived more or less nourishment. It appears to be confined to localities rich in vegetable humus, amongst which it grows and spreads luxuriantly; hence, under some of the old elm hedgerows near Hayes Common, Kent, which are planted in hollows, favouring the accumulation of leaf-soil, it is abundant; whereas under others in the same locality, that have been planted on ridges from which the fallen leaves have been washed or blown away, not a single specimen is to be met with. The same conditions appear to influence its occurrence in some of the Yorkshire hazel coppices.

---

* "On the Parasitical Connection of *Lathræa Squamaria*, and the Peculiar Structure of its Subterranean Leaves." Journ. Linn. Trans. vol. xvi., p. 39.

† *Loc. cit.* p. 41.

‡ "On the Structure and Functions of the Scale-leaves of *Lathræa Squamaria*." Journ. R. M. S., Oct. 1880 (1 pl.).

The minute seeds are in all probability carried down through the loose leaf-soil by rain, as young plantlets may frequently be met with at a depth of eight or ten inches below the surface, whereas we have not met with a single instance of a seed germinating near the surface.

On germination a strong conical tap-root is produced, which gives off numerous smaller branches, each furnished with several minute hemispherical suckers, by which the young plant is fixed to its host. All seedlings were found attached to roots, and in the earliest stage probably every plant depends entirely on food obtained from some living host, which is certainly not always the case as the plant becomes older. The primary stem we have always found growing downwards at first, as described by Bowman, generally remaining unbranched for three or four inches, and everywhere covered with fleshy, imbricated, opposite and decussate, broadly reniform, colourless scale-leaves. Towards the apex of the stem several axillary branches are produced, similar in structure to the primary stem, which, owing to the crowded arrangement of the leaves from whose axils they originate, form a rosette. The plant never appears to pass this stage of development or produce flowers during the first year; but if the frost is not too severe it continues to grow throughout the winter, for during the summer the plant, as a rule, has penetrated to a depth of about a foot below the surface, and thus secured itself from ordinary climatic influences.

After devoting a season to the development of vegetative organs and the accumulation of a considerable amount of reserve material in the fleshy leaves, the second year's work is confined to the production of reproductive parts, each of the lateral branches terminating in a flowering stem; the crowded arrangement of the branches accounting for the clustered habit of the scapes which, when viewed from the surface, appear to originate from one point. During this period the main stem has continued to elongate, when it again produces a fascicle of branches, which produce flowering stems the following year, and by this mode of growth the plant migrates, step by step, for several yards from its starting-point. Flowers are never produced more than once from the same branches, but when the plant is very vigorous the flowering branches also produce clusters of branches, each capable of continuing the plant, the result of which is a complicated branch system, requiring no small amount of perseverance to verify, on account of the great depth at which the plant grows, its extreme brittleness, and the complication of roots amongst which it usually occurs. We have isolated masses of the plant, the result of several years' growth, weighing six pounds, a single fascicle of branches often weighing more than a pound, and in some districts in Kent the hedge-banks are one mass of the underground parts of this plant, penetrating to a depth of more than two feet below the surface. No food is provided by the primary root after the first year, the rosettes produced later being provided with fibrous rootlets springing from the stem between the leaves, or food is

supplied by the leaves themselves, in a manner to be described later on. In fact, each rosette of branches may be looked upon as a biennial plant; for although the organic connection between the fascicle remains, yet each after flowering becomes brown and soon dies, but persists in a carbonized condition for some years. Numerous small roots proceed from all sides of the rhizome, and are furnished with an imperfectly differentiated epidermis, some of the cells growing out as root-hairs; a broad band of cortical parenchyma, the cells circular in transverse and oblong in vertical section, sometimes containing a few minute spherical starch grains; bundle-sheath well marked, enclosing the pericambium of delicate elongated thin-walled cells, which surrounds an axial bundle of vessels, the peripheral members of which are small in diameter, with imperfect spiral or annular thickenings, the central ones large, prismatic, and coarsely reticulate, passing into scalariform and pitted types. The haustoria or discs are best developed on the primary root and its branches, and may be terminal or interstitial, sometimes so numerous as to give a moniliform appearance to the rootlets; they are always minute, rarely exceeding a line in diameter. The parenchymatous cells are large, with conspicuous nuclei, and there are large cavernous intercellular spaces. The small peripheral constituents of the xylem do not enter the disc, but the central vessels, which are larger in diameter than those of the root proper, form a complicated plexus, the component cells being short and very irregular in shape, with the transverse septæ often imperfectly absorbed. The discs are at first spherical or pyriform, but when they come in contact with a branch the apex becomes concave, the epidermal cells elongate in the form of short root hairs, and penetrate between the epidermal cells of the host, while at the same time the central vascular portion penetrates deeper, until it reaches the pericycle of the host, from which it absorbs nutriment. This penetration is evidently affected by the secretion of some corrosive substance acting on the cell-walls of the host, their structure being destroyed and reduced to a homogeneous mass in the neighbourhood of the parasite.

Tannic acid is present in every underground part of the plant, and can also be detected in the disintegrated parts of the host, and possibly this substance may in some way enable the parasite to effect an entrance into the tissues of its host. The lateral discs appear to be developed only when the root comes in contact with the host, and consequently the direct result of some irritation brought about by this contact, although the terminal discs may be seen in various stages of development up to the obovate shape, without contact with the host-plant.

Iron is also present in the plant, and the dark colour assumed when old or dried appears to be due to a combination of this element with tannin.

The leaves are fleshy, often exceeding three lines at the thickest part; generally broader than long, reniform, or with the apex more or less produced; sessile, attached by a broad base, upper surface flat or concave, lower convex and marked with lines

running from base to apex, presenting the appearance of buried veins, but which in reality correspond to cavities in the substance of the leaf. The cavities are large, from five to nine in number, very irregular in shape, and connected by tortuous canals, the whole communicating with the exterior by means of a curved slit near the base of the under surface of the leaf, formed by the involute margin of a free portion coming in contact, or nearly so, with the part above, and leaving a passage by which water can enter the interior by capillary attraction. The epidermis is well marked, consisting of small cells, the free walls of which are only slightly thickened, without outgrowths of any kind, and not at all cuticularised; it follows the involutions of the leaf and lines the internal cavities, where it is thickly studded with large well-developed glands of three distinct kinds. (*a*) Glands stipitate, springing from a single epidermal cell, pedicel short, cylindrical or slightly narrowed upwards, one-celled, rarely with a second short cell at the apex; head four-celled, cells arranged in a cruciate manner when seen from above, sometimes only three-celled, filled with dense granular protoplasm. Sometimes the cell-wall grows out in the form of very fine filamentous prolongations, giving the gland a velvety appearance. This form is most abundant, and might be described as crowded. (*b*) Glands sessile, basal cell broadly elliptical in optical section, equal in area to about six ordinary epidermal cells, in vertical section bi-convex or nearly circular, but composed of two circles having different diameters, and recalling to mind a section of the human eye; one half sunk in the substance of the leaf, the remainder projecting into the cavity; the head of the gland, corresponding to the cornea of the eye, consists of four long narrow cells in one plane, containing granular protoplasm, which appear in optical section to be surrounded by a continuous border, owing to the large basal cell becoming narrower after leaving the level of the epidermis, and which must be considered as a very short pedicel. The lower convex surface of the large basal cell or pedicel rests upon four cells, each of which has a constriction, so that where they meet four elliptical intercellular spaces are formed, which can be seen by focussing through the gland from above, or in vertical section. This form of gland is also abundant, and although fewer in numbers, probably exposes as great a surface as the first type. (*c*) The third form of gland has a long slender jointed pedicel, and a small multicellular head, and agrees in structure with the glands that cover the rachis and bracts, and is very rare in the cavities, usually not more than two or three being met with in cutting up a leaf.

Underlying the epidermis of the cavities is a thin wall of tissue, composed of small nucleated cells filled with granular protoplasm, and interspersed with isolated large irregularly-shaped reticulated cells, which are most frequent below the large sessile glands. The remainder of the leaf consists of very large hexagonal cells, containing starch grains and crystalloids. The veins, which are numerous and well developed, are sunk in the substance of the leaf, and form loops which surround the cavities, running between the

compact wall of tissue lining the cavities, and the starch-bearing cells.

The following micro-chemical reactions were noted in the small-celled tissue lining the cavities:—Gardiner's test for tannin, a solution of ammonium molybdate in concentrated ammonic chloride, gave a copious yellow precipitate; the presence of this substance was also proved by the iron and potassic bichromate tests. The nuclei assume a bright greenish blue colour when treated with ferro-cyanide of potassium and acetic acid, and afterwards washed in alcohol, proving the presence of nuclein; the same structures also contain iron, becoming red with sulpho-cyanate of potassium, and a brilliant clear blue with ferro-cyanide of potassium; the iron occurs as a ferrous compound, and is absent from the remainder of the cell. The proportions of the various reagents were used as given by Poulsen.* With dilute potassic hydrate, all parts of the plant containing protoplasm become clear primrose-yellow, with the exception of the cells forming the compact tissue lining the cavities, the contents of which change to a bright orange-brown; concentrated ammonia gives the same reactions. The yellow colour points to the presence of tannin, but what the orange-brown colour indicates is uncertain.

When portions of the plant are kept for some time in alcohol, an aqueous solution of chloral hydrate, or concentrated ammonia, the liquid gradually becomes dark brown; in the first two the plant blackens, in the last mentioned it changes to a bright yellow.

The cavities of the leaves do not contain air, as supposed by Bowman, but water, having an acid reaction, due to a secretion from the stipitate glands, which can be proved by placing a section in litmus solution, when the acid reaction first shows itself in the liquid surrounding these glands. The large sessile glands exercise an absorptive function, the protoplasm in their cells undergoing changes after being in contact with water that has been mixed for some time with vegetable humus along with portions of the crushed leaves, the latter being necessary to enable the water to dissolve certain inorganic and organic matters from the humus, which are in all probability absorbed and assimilated by the plant.

In some plants the parasitic discs are very few in number, and in several instances, where great care was exercised in exposing the buried portions, not a single disc has been met with; but admitting that a few were overlooked, it is difficult to comprehend how so small a number could supply the plant with the required amount of food, a difficulty which appears to have been realised by Sachs, who says,† "The decaying foliage in which *Monotropa*, *Epipogium*, and *Corallorhiza* grow, do not give up to water the serviceable materials which are still present in it, any more than the cellulose of the endosperm of the date, or the starch of the endosperm of grasses, or the oil of the seed of *Ricinus*, can be extracted by water; but these saprophytes nevertheless obtain their

---

* 'Botanical Micro-Chemistry.' Poulson—Trelease. American Edition.

† 'Text Book of Botany.' Second English Edition, p. 721.

nutriment from them. The fact that the roots of plants of this kind are so few in number and diminutive in length, as in *Neottia*, or are entirely wanting, as in *Epipogium* and *Corallorhiza*, is very remarkable in connection with this. These plants are concealed in the nutrient substratum till the time of flowering, and may act upon it by their whole surface." Although *Lathræa* has up to the present been described as a parasite, which to a certain extent is correct, more especially while young, yet we consider it much more of a saprophyte than a parasite, scale-leaves never being absent; whereas the discs, upon which its parasitism depends, are, as the plant becomes old, frequently very rare, or apparently altogether absent, while in other instances roots and discs are very numerous on old plants; their presence or absence depends entirely on the position in which the plant finds itself; if small living roots of a suitable host-plant are present they are developed, whereas, if the plant has migrated to a locality from which they are absent, it possesses the power of supporting itself by means of its scale-leaves.

That saprophytes do act on organic matter by their whole surface was very clearly shown in one instance, where a plant of *Lathræa* had come in contact with the dead root of an elm that had become soft, but yet retained its outline, and into which some branches had half buried themselves, leaving, when removed, depressions corresponding to their shape, while two other branches had penetrated for more than an inch into its substance, teredo-fashion. Sections of the root showed its substance reduced to a pulp, wherever the saprophyte had come in contact with it, undoubtedly due to some secretion from the leaves, as no trace of roots or discs existed.

The secretion by the leaves of a liquid having an acid reaction, was noticed by Gilburt,* who says, "That this takes place somewhat abundantly may be inferred from the fact that in the bank from which I have taken my material, and which is composed of a light friable loam, the soil immediately surrounding the *Lathræa* was saturated with moisture, while all beside could be crumbled apart with the fingers."

In some instances the roots are covered with the mycelium of a fungus, agreeing in habit with the mycelium described by Kamienski† as enveloping the roots of *Monotropa hypopitys*, which plant the author does not regard as a parasite, having failed to detect any connection with the root of a host; he considers it as obtaining its food from the soil through the medium of the felt of mycelium, the latter in turn subsisting on food derived from the *Monotropa*, the connection being regarded as an example of symbiosis rather than parasitism. The occurrence of mycelium on the subterranean parts of *Lathræa* is not sufficiently constant to admit of the above theory being accepted as explanatory of its function in connection with this plant.

---

* *Loc. cit.*, p. 3.

† Mem. Soc. Nation, Sci. Nat. Cherbourg, xxiv. (1884), pp. 5—40. 3 pls.

Explanation of Plate 269.—Leaf-structure in *Lathræa Squamaria* L.—Fig. 1. Under surface of leaf, × 2. 2. Section through leaf along the line *a*, *b*, in Fig. 1. The upper surface is marked × ; × 2. 3. Section through leaf along the line *c*, *d*, in Fig. 1. The upper surface is marked × ; × 2. 4. Section through stem and two opposite leaves in the direction marked *c*, *d*, in Fig 1 ; × 10. 5. Surface view of a portion of the interior of a leaf cavity ; *a*, stipitate glands ; *b*, large sessile glands ; *c*, epidermal cells ; × 350. 6. Surface view of large sessile gland, after focussing through the upper part ; *a*, the four supporting cells ; *b*, the intercellular spaces ; × 350. 7. Stipitate glands, showing cell-walls of the head covered with filamentous outgrowths ; × 350. 8. Section of portion of leaf from the outside to one of the cavities ; *a*, outer epidermis ; *b*, inner epidermis ; *c*, large-celled, starch-bearing tissue ; *d*, small-celled tissue forming wall of cavity, cells containing protoplasm ; *e*, position of vein ; *f*, stipitate glands ; *g*, large sessile gland ; *h*, one of the four absorbent cells forming head of gland ; *i*, broad pedicel of gland ; *k*, one of the four intercellular spaces ; *l*, one of the four constricted basal cells upon which the pedicel of the gland rests ; *m*, one of the large coarsely reticulate irregularly shaped cells met with in the tissue forming the wall of the cavity ; *n*, one of the glands with a long multicellular pedicel, rare in the cavities, but abundant on the above-ground parts of the plant ; × 350. 9. Section of a portion of the decayed root of an elm (*a*), into which a branch of *Lathræa* (*b*) had eaten its way ; × 100.

THE MOSSES OF ROSS-SHIRE.

By H. N. Dixon, M.A., F.L.S.

As very little seems to have been done in working out the mosses of Ross-shire, it may be of interest to give a list of those found during a stay of ten days in the county in the year 1883. I give the list *in extenso*, for to judge from the 'London Catalogue' some of the most widely distributed species are hitherto unrecorded from this district ; it will be seen, for instance, that *Orthotrichum leiocarpum*, *Rhynchostegium confertum*, and *Amblystegium riparium* are unrecorded in the whole of District 17 of the Catalogue.

Of the ten days two were spent at Strome Ferry and eight at Kintail on Loch Duich. From the latter place I went up Ben Attow (4000 ft.), and the most interesting records, including *Dicranum elongatum*, are from there.

Several of the plants have been submitted to Dr. Braithwaite and other authorities ; I have prefixed an asterisk to those which have been verified in this way.

Sphagnum acutifolium Ehrh. Strome Ferry. — *S. cuspidatum* Ehrh. Strome Ferry. — *S. rubellum* Wils. Glomak. — *S. subsecundum* Nees. Glen Shiel. Var. *contortum* Schultz. Glen Shiel. — *S. squarrosum* Pers. Ben Attow.

Andreæa petrophila Ehrh. Kintail. — *A. Rothii*, var. *falcata* Schpr. Kintail. — *A. alpina* Turn. Glomak. Ben Attow.

Gymnostomum curvirostrum Ehrh. Strome Ferry.

Weissia cirrhata Hedw. Glen Shiel.

Dicranella squarrosa Schrad. Kintail.

Dicranum Starkii W. & M. Ben Attow. — *D. falcatum* Hedw. Ben Attow. — **D. elongatum* Schwg. Rock, Ben Attow. — *D.*

scoparium L. Strome Ferry. — *D. majus* Turn. Strome Ferry. — *D. palustre* Bry. Brit. Thatched roof, Kintail.

Campylopus atrovirens DeNot. Strome Ferry. Kintail. Glen Shiel. — **C. fragilis*, var. *densus* B. & S. Strome Ferry.

Brachyodus trichodes W. & M. Kintail. My specimens were very poor, but I think there is no doubt of it.

Blindia acuta Hedw. Strome Ferry. Ben Attow. Kintail.

Didymodon rubellus B. & S. Strome Ferry. — *D. cylindricus* Bruch. Strome Ferry.

Ditrichum homomallum Hedw. Strome Ferry.

Barbula tortuosa L. Strome Ferry. Kintail.

Ceratodon purpureus L. Strome Ferry. Ben Attow. Glen Shiel.

Distichium capillaceum L. Glen Shiel.

Encalypta streptocarpa Hedw. Glen Shiel.

Grimmia maritima Turn. Strome Ferry.

Ptychomitrium polyphyllum Dicks. Strome Ferry.

Racomitrium aciculare L. Kintail. — *R. protensum* Braun. Strome Ferry. — **R. suleticum* Funck. Strome Ferry. Kintail. — *R. heterostichum* Hedw. Strome Ferry. — *R. fasciculare* Schrad. Strome Ferry. — *R. lanuginosum* Hedw. Strome Ferry. — *R. canescens* Hedw. Strome Ferry. Glen Liek.

Ulota crispa Hedw. Strome Ferry. — *U. intermedia* Schpr. Strome Ferry. — *U. phyllantha* Brid. Ash trees, Kintail. — *U. Hutchinsiæ* Sm. Kintail.

Orthotrichum leiocarpum B. & S. Ash trees, Kintail.

Splachnum sphæricum L. fil. Strome Ferry. Ben Attow.

Entosthodon ericetorum Bals. Ben Attow. — *E. Templetoni* Hook. Kintail.

Bartramia ithyphylla Brid. Strome Ferry.

Philonotis fontana L. Strome Ferry. Kintail.

Breutelia arcuata Dicks. Strome Ferry.

Leptobyrum pyriforme L. Ben Attow.

**Webera acuminata* Hoppe. Strome Ferry. Kintail. Glen Shiel. — *W. elongata* Dicks. Glen Shiel. — *W. nutans* Schreb. Glen Shiel. — *W. albicans* Wahl. Strome Ferry (♂).

Zieria julacea Schpr. Glen Shiel.

Byrum erythrocarpum Schwg. Ben Attow. — *B. alpinum* L. Kintail. — *B. pallens* Swartz. Strome Ferry. — *B. pseudo-triquetrum* Hedw. Kintail.

**Mnium serratum* Schrad. Kintail. — *M. punctatum* Hedw. Strome Ferry. — *M. subglobosum* B. & S. Glen Shiel.

Oligotrichum hercynicum Ehrh. Ben Attow.

Diphyscium foliosum L. Kintail.

Fissidens adiantoides Hedw. Strome Ferry. — *F. decipiens* DeNot. Strome Ferry.

Hedwigia ciliata Dicks. Strome Ferry.

**Heterocladium heteropterum* Bruch. Kintail.

Brachythecium plumosum Swartz. Strome Ferry. Kintail.

**Hypocomium flagellare* Dick. Strome Ferry; on rocks.

Rhynchostegium confertum Dicks. Strome Ferry.

Plagiothecium undulatum L. Strome Ferry.

Amblystegium riparium L. Salt-marsh, Loch Duich. Var. *longifolium* Brid. Ben Attow.

Hypnum fluitans L. Kintail. — *H. uncinatum* Hedw. Glen Shiel. — *H. commutatum* Hedw. Strome Ferry. — *H. cupressiforme* L. Strome Ferry. Kintail. — **H. palustre* L., var. Strome Ferry. — **H. patientiæ* Lindb. Wet sandy ground, Strome Ferry. Mr. Bagnall tells me he thinks this is my plant, though it is rather a different form to his specimens. — **H. ochraceum* Turn. Glen Liek. — *H. sarmentosum* Wahl. Ben Attow. — **H. scorpioides* L. Ben Attow.

Hylocomium loreum L. Strome Ferry.

I subjoin the names of a few more which I found, during the same visit, in other localities in Scotland.

Skye.

Dicranum falcatum Hedw. Ben-na-Cailleach.

**Campylopus atrovirens* var. *falcatus* Braithw. Loch Coruisk. — *C. pyriformis* Brid. Loch Slapin.

Grimmia orata W. & M. Loch Coruisk.

Ulota Hutchinsiæ Sm. Loch Coruisk.

Webera carnea L. Ben-na-Cailleach.

Bryum intermedium W. & M. Broadford.

Diphyscium foliosum L. Loch Slapin.

Dalwhinnie.

Sphagnum subsecundum var. *obesum* Wils. Sow of Athol.

Anoectangium compactum Schl. Sow of Athol.

Dicranum falcatum Hedw. Sow of Athol. — *D. fuscescens* Turn. Sow of Athol.

**Ceratodon conicus* Lindb. Dalwhinnie (*c. fr.*).

Bartramia Œderi Gunn. Sow of Athol.

Webera acuminata Hoppe. Dalwhinnie. — *W. annotina* Hedw. Sow of Athol (*c. fr.*).

Mnium cinclidoides Blytt. Sow of Athol.

Hypnum ochraceum Turn. Dalwhinnie. — *H. stramineum* Dicks. Sow of Athol. Dalwhinnie.

SOME ADDITIONAL JAMAICA FERNS.

By G. S. Jenman, F.L.S.

Most of the following additional Jamaica Ferns have been brought to light of late, chiefly by my friend Mr. R. V. Sherring, who spent the past winter in exploring the less known (so far as the fern vegetation is concerned) parts of the island, and a few by my former colleague, Mr. J. Hart, Superintendent of the Government Cinchona Plantations. The rest have resulted from systematically working through my own collection, and in a further examination which my late leave of absence in England enabled me to give to the Kew and British Museum collections.

Alsophila aspera R. Br.—There are two very distinct varieties of this:—*major*, in which the parts are ample, the pinnulæ being 1 in. or over wide, with crenate segments; *minor*, very much smaller, the pinnulæ being not over ½ in. wide, and the segments even-edged.—Rose Hill, gathered by Mr. Sherring.

Hemitelia Imrayana Hk.—Differs only from *H. grandifolia* Spr. by its sharply-pointed segments, and, so far as I have seen specimens, appears to be the local representative of that species, of which I regard it a variety. It was gathered over thirty years ago by Miss Taylor, next by Wilson, and very recently, at Rose Hill, by Mr. Sherring.

H. Wilsoni Hook.—The pinnæ present two states; the smaller have their pinnulæ only slightly lobed (and often narrowed or sub-entire below the lobed outer part), the base being fully adnate; while in the larger the pinnulæ are deeply pinnatifid throughout to two-thirds or three-fourths, and are free at the base, but sessile. The involucres are very large, bilobed, and almost enclose the sori, which are medial in position at first.

Hemitelia Sherringi, n. sp.—Trunk tall, very paleaceous above. Fronds ample, 7–9 ft. long, including the stout, muricate, and freely paleaceous petiole, 3–3½ ft. wide, tripinnatifid, pellucid, subcoriaceous, glabrous, except on the costæ, which are pubescent, bright green on the upper side, pale beneath. Rachis stout, puberulous, sparsely muricate at the base, rather scaly and furfuraceous in the axils of the pinnæ. Pinnæ petiolate, the base swollen, 1½–2¼ ft. long, 7–9 in. wide, distant their own width from base to base, fully pinnate to the acuminate pinnatifid apex. Pinnulæ contiguous between the outer and inner ones, which are rather more apart, numerous, spreading, only the upper ones quite sessile, 3½–4½ in. long, 1 in. wide, with a rather elongated serrato-acuminate point, within which they are deeply pinnatifid, most deeply at the base. Segments somewhat open, with an acute or rounded sinus between, linear-oblong, rounded, rather falcate, crenate, 5–6 l. long, 2 l. wide. Veins forked from near the base. Sori forming a double row close to the midrib, extending quite from the base, but not reaching the top of the segments. Receptacles densely scaly. Involucres very shallow, completely encircling the receptacles, the thin margin more or less lobed or incised.—Rose Hill. A fine species, and remarkable as showing by the completely circular involucres a passage into *Cyathea*.

H. microsepala, n. sp.—Trunk several ft. high, paleaceous at the top. Petioles spreading, scaly at the base, brown, a foot less or more long, freely set with short prickles. Fronds oblong, acuminate, 3–4½ ft. long, 1½–2½ ft. wide, tripinnatifid, dark green above, rather glaucous beneath. Rachis wood-brown, rather slender, channelled, muricate in the lower part. Pinnæ spreading, contiguous, shortly petiolate, 1–1¼ ft. long, 5–6 in. wide. Pinnulæ contiguous, only the outer ones quite sessile, finely serrato-acuminate, 3 in. long, 8–10 l. wide, pinnatifid nearly to the midrib. Segments close, oblong, rounded, crenate, 4–5 l. long, 1½–2 l. wide, not falcate. Costæ and costulæ pubescent above, the latter with a

few deciduous scattered bullate brown scales beneath, surfaces otherwise glabrous. Veins forked, the inferior from the middle, pellucid. Sori inserted at or near the fork, copious, but generally falling short of the top of the segment. Receptacles densely scaly. Involucres very small, confined to the inner side, dark brown, thin, usually not bilobed. — Gathered at Bull Head, Clarendon parish, 3000 ft. altitude. This is the analogue of *H. multiflora* R. Br., of the mainland, from which it differs by its smaller size, less vestiture, and very small involucres. In aspect it exactly corresponds with *Cyathea dissoluta* Baker.

Dicksonia antillensis, n. sp. — Rootstock not seen. Stipites erect, 2–2½ ft. long, bright brown, channelled, naked. Fronds erect, 3–4½ ft. long, 2½–3 ft. wide, truncate at the base, the apex acuminate, finely decompound. Pinnæ in numerous pairs, spreading at right angles, sessile, oblong-lanceolate, the lowest pair usually somewhat smaller than the next above, and these pairs most apart, quadri-pinnate, 1–1½ ft. long, 6–8 in. wide. Secondary and tertiary divisions the same shape, but proportionately reduced, quaternary deeply cut into spreading segments ⅓–¼ l. wide, which when barren are sharply pointed, and the larger ones emarginate. Texture thin, pellucid. Colour bright dark green. Surfaces naked. Veins simple in the final segments. Sori terminal, on most or all the segments. Involucre bivalved, laterally compressed, the outer valve formed of the leaf-segment. Rachis and costæ channelled, glossy, stramineous or brown.—Gathered lately by Mr. Morris. The character of the involucres give it as good claim to be placed in *Davallia*, but it agrees exactly in habit and outline of frond with *Dicksonia cicutaria* Sw. and the allied species, for which reason I place it here. From those species it is readily distinguished by its fine cutting and the flat terminal involucres, every final segment of the fertile fronds bearing one. It is as finely cut as *Davallia fumarioides* Sw. or *Gymnogramma schizophylla* Baker.

Lindsaya falcata Willd.

Adiantum nigrescens Fée. — Distinguished from the *striatum* group, with which its alliance is, by the ebeneous polished smooth petioles, rachises, and stipitate segments.

Cheilanthes Reesii, n. sp.—Stipites tufted, slender, polished, dark chestnut-brown or blackish, channelled on the upper half, 2–5 in. long, with a few minute deciduous scales at the base. Fronds multifid, lanceolate or ovate-lanceolate, broadest in the lower half, 4–8 in. long, 1½–4 in. wide, tripinnate. Pinnæ regular from the base of the frond upwards, contiguous, numerous, spreading alternately, lanceolate, basal ones the largest or not, 1½–3 in. long, ⅓–1 in. wide, nearly sessile, terminating in a subentire, serrulate, bluntish apex. Pinnulæ merely lobed at the base or ½–¾ in. long and fully pinnate, with 2–6 rather spathulate small segments on each side, about 1½ l. long, ½–1 l. wide, the terminal larger and lobate at the base, all faintly crenate or serrulate on the outer margin. Texture membrano-chartaceous; colour dull cloudy green; surfaces naked. Rachis and costæ polished and coloured like the stipites, channelled and scariose-edged. Veins pinnate,

the branches very oblique, simple in the larger segments, not entering the margin. Sori copious, contiguous, in distinct bright brown marginal dots, 1–4 to the side of a segment. Involucres minute, subreniform, eventually concealed by the sori. — Gathered at Oxford, St. Elizabeth parish, by Rev. T. L. Rees, after whom it is named. It belongs to the section *Adiantopsis*.

Pteris longibracteata Agdh.—Distinguished by the long (especially the terminal) segments, and broadly rounded open sinus, copious fine areolation of the veins, without exterior free branches, and peculiar rootstock, which consists of an aggregation of nutlets, each of which unfolds into a single frond, having its own roots, and quite independent of the rest.

Asplenium parrulum Mart. & Gal.

Asplenium jamaicense, n. sp. — Rootstock fibrous, erect, tomentose, and slightly dark scaly. Stipites grey-green, except the base, tufted, those of the barren fronds 1–2 in. long, of the fertile 3–6 in., naked. Fertile fronds central, very erect, the barren external, much smaller, and erecto-spreading; the former oblong-lanceolate, 4–7 in. long, 1¼–1½ in. wide, the base truncate, the apex narrowed and terminated in a lobate blunt or rounded segment. Pinnæ ½–¾ in. long, about two-thirds as broad, spreading, approximate or apart, about 8–10 to a side, rhomboidal-oblong, most shortly petiolate, the upper base nearly parallel with the rachis, and generally expanded or subauricled, the under cut away half the length of the inferior margin, broadly rounded in the outer part; upper and outer margin subdentate. Veins pinnate, forked, oblique, sometimes flabellate or again pinnate in the auricle or lobe of the superior base. Texture herbaceo-chartaceous; surfaces naked; colour grey-green. Rachis flattish, slightly margined, like-coloured with the stipites. Sori 1½–3 l. long, spreading obliquely on each side of the midrib, not reaching the margin. — Frequent through the island on rocks from low altitudes up to 6000 ft. A larger plant than *A. dentatum* L., between which and *A. obtusifolium* it is intermediate.

A. Hartianum, n. sp. — Rootstock stout, erect, the crown clothed with lanceolate brown scales. Stipites cæspitose, erect, 10–18 in. long, channelled, brown, puberulous, the dark base clothed with deciduous scales like those of the rootstock. Fronds oblong-lanceolate, acuminate, with a pinnatifid serrate apex, broadest or not reduced at the base, 2–3½ ft. long, 1–1½ ft. wide. Rachis channelled, brown, ciliate-puberulous. Pinnæ very lax throughout, the upper ones apart, and sessile, becoming gradually more distant and increasingly stipitate or petiolate towards the base, 5–10 in. long, 1½–3½ in. wide, lanceolate or oblong-lanceolate, the outer part pinnatifid and serrato-acuminate, the inner half or more pinnate. Pinnulæ apart or subdistant, oblong, rounded, ¾–1¾ in. long, 3–7 l. wide, the interior ones of the lower pinnæ reduced, and the lowest one on the inferior side of the 1–2 lowest pair of all absent, free and rounded at the base, becoming gradually adnate to the costæ and closer as the pinnatifid outer part is approached. Margins freely crenato-dentate, the teeth 1–2 l. wide. Texture

chartaceous; colour dark clear green above, paler beneath; upper surface naked, under subtomentose and glandulose, the vestiture rusty or ferruginous. Veins pinnate and forked in the pinnulæ of the smaller fronds; in the larger, pinnate in the lobules or teeth of the pinnulæ. Sori reaching half-way to the margin from the mid-rib, few or several double.—It is with much reluctance I venture to introduce a new name to the *radicans* group of Asplenia, but I have failed to match this at the Kew and British Museum Herbaria, or in books. It comes nearest the least divided states of *A. Klotzschii* Mett., and is quite distinct from any of the several Jamaican states of *A. radicans* Schkr. There appear to be two forms.

A. brunneo-viride, n. sp.—Rootstock stout, erect, the crown clothed with brown scales. Stipites cæspitose, strong, erect, brown, clothed at the base like the rootstock, 2–3 ft. long. Fronds ample, erecto-spreading, 3–4 ft. long, 2–3 ft. wide, quadripinnatifid. Pinnæ alternate, oblong-lanceolate, acuminate, 1¼–1¾ ft. long, 6–9 in. wide, shortly petiolate, oblique-spreading, the lower ones deeper on the lower side. Pinnulæ numerous, contiguous, alternate, not sessile, about the same shape as the pinnæ, the acuminate point serrate, 3½–5 in. long, 1¼–1½ in. wide; tertiary segments oblong, rounded at the point, free and nearly sessile at the base, contiguous but not touching, ¾–1 in. long, 2½–4 or 5 l. wide, deeply pinnatifid; lobes oblong, entire, rounded at the end, 1½–2½ l. long and about half as wide, the sinus between narrow. Texture chartaceous, pellucid; surfaces, except on the ribs, naked, light green. Rachis and costæ wood-brown or darker, freely channelled: costæ and costulæ margined with green membranous wings, and fibrillose with small brown scales. Veins pinnate; branches simple, 2–3 to a side. Sori copious, ¼–½ l. long, the lowest anterior one on each lobe double; involucres ample, tumid, pale brown.—A larger plant than *A. Wilsoni* Baker and *A. sandwichianum* Mett., to both of which it is closely allied.

A. (Athyrium) **Taylorianum,** n. sp. — Rootstock and stipites not seen. Fronds ample, tripinnatifid, 2½–3 ft. long, 2 ft. wide, dark green, rather membrano-chartaceous, glabrous and glossy, except the costæ and costulæ, which are slightly fibrillose and otherwise scaly beneath or in the axils. Pinnæ spreading or erecto-spreading, 10–12 in. or more long, 6 or more in. wide, petiolate from ¼–½ in. Pinnulæ spreading, contiguous, sessile, except perhaps the basal pair in the lower pinnæ, truncate at the base, the much acuminated point rather deeply serrated to the end, 3–3½ in. long, ¾ to nearly 1 in. wide, deeply pinnatifid to within a line of the midrib. Segments oblong, flat, broad, rounded, dentate, conspicuously so in the outer part, 2 l. wide, 4–5 l. long. Veins simple, or the lowest anterior one sometimes forked, 4–5 to a side. Sori short, nearer the midrib than margin, about ½ l. long, 3–4 to each side of the segments. Involucres vaulted. — Of local species this comes next *A. altissimum* Jenman, from which it differs by its less robust character, thinner texture, sessile pinnulæ, conspicuously dentated final parts, the teeth of which are rather obtuse, and the very short sori. I have named this species in memory of the late

Miss Fanny Hope Taylor, who in the years 1852–4 made an excellent collection of ferns in Jamaica, which included among other rare species the now well-known and beautiful *Gymnogramma schizophylla*—a species only rediscovered where she found it, and named, over twenty years later.

Aspidium dissectum Fee.

Nephrodium sanctum Baker, var. *magnum*. — Fronds a foot or more long, 3–4 in. wide. Pinnæ contiguous or apart, 2 in. long, 5 l. wide, subequilateral, fully pinnate within, beyond that pinnatifid on both sides to the acuminate point. Involucres evident, ciliate.—This forms a passage into the *conterminum* group.

Nephrodium caribæum, n. sp. — Stipites densely tufted, slender, erect, light brown, slightly scaly at the base, 2–4 in. long, slightly channelled, puberulous. Fronds erect, 1¼–1½ ft. long, 3–4 in. wide, gradually dwindling at the base to small trifid or trifoliate segments. Rachis light brown, slender, puberulous, faintly channelled. Pinnæ spreading, sessile, contiguous or more or less apart, broadest at the base, from whence they taper to the acuminate serrato-entire point, 2 in. long, 4–5 l. wide, subequilateral, uniformly deeply pinnatifid, or the very base fully pinnate. Segments linear-oblong, close, except the enlarged basal pair, which are nearly or quite free, ¾–1 l. wide, 2 l. long (the basal ones 3 l.). Texture firm, pellucid; dark green above, paler beneath; slightly ciliate on the ribs above, beneath glabrous or puberulous. Veins close, simple. Sori medial, copious. Involucres evident, ciliate. —Intermediate between the large variety of *N. sanctum* and *N. Nockianum*.

N. Nockianum, n. sp. — Rootstock small, erect; stipites tufted, erect, very slender, brownish, 4–6 in. long, channelled, puberulous or slightly pubescent, becoming naked, with a few small deciduous brown scales near the base. Fronds erect, bipinnatifid, 1–2 ft. long, 3–4 in. wide, lanceolate or oblong-lanceolate, the base reduced gradually or abruptly, but usually not tapering. Pinnæ spreading horizontally, oblong-lanceolate-acuminate, sessile, close or more or less distant, the reduced lower ones most distant and usually rather deflexed, central ones 1½–2 in. long, 5–6 l. wide, the acuminated point, which is not sharp, serrulate-entire, within this pinnatifid nearly to the costa. Segments close, nearly or quite straight, but rather oblique, rounded and even, or faintly crenulate at the point, not wider at the base, 3 l. long, ¾–1 l. wide. Rachis very slender, finely greyish or rusty pubescent, channelled. Costæ similar. Surfaces glabrous or the upper slightly ciliate, glandulose and pale beneath, above dark green. Texture thin and pellucid. Veins oblique simple, or the posterior one of the segments on the inferior side of the pinnæ forked, about six to a side. Sori medial or rather nearer the margin. Involucres developed, ciliate.—A slender, thin, very pellucid plant belonging to the *conterminum* group.

N. rigidulum Baker?

N. paucijugum, n. sp. — Rootstock thick as a quill, horizontally repent, the growing point in advance of the petioles, and

densely clothed with brown acuminate reticulated scales. Stipites contiguous or apart, erect, slender, naked, channelled, stramineous, ¾–1 ft. long or over. Fronds bipinnatifid, 9–12 in. long, 5–6 in. wide, truncate at the base, reduced upwards to a long acuminate pinnatifid terminal pinna. Texture chartaceous, pellucid. Surfaces naked and glossy; colour light green. Rachis slender, channelled, stramineous. Pinnæ spreading, the lower ones, which are not reduced, horizontally, apart, acuminate, 3–3½ in. long, ½–⅔ in. wide, the upper ones broadest at the base and sessile, the lower one somewhat narrowed there and hardly sessile, very deeply pinnatifid throughout, rather deeper usually on the superior side of the costæ. Segments close or with a somewhat open sinus between, oblique, blunt-acute, often pointleted, 4–5 l. long, 1–1½ l. wide. Veins simple or forked in the inferior segments, oblique, 7–10 to a side, the lowest pair entering at or above the sinus. Sori not seen.—Belongs to the *Serra* and *Sloanei* groups, but the texture is not rigid.

N. Filix-mas Rich. — A most interesting discovery, for which I have looked for years, made now by Mr. Morris. This appears to be the first discovery of this species in the West Indies, and the form is exactly that common on the tropical mainland.

N. calcareum, n. sp. — Stipites 1 ft. long or over, cæspitose, erect, furnished with scattered appressed dark brown scales at first, puberulous, channelled. Fronds erect, 2 ft. long, 6–8 in. wide, the base gradually reduced to segments ½–1 in. long, the acuminated apex pinnatifid, terminating in an entire rather obtuse point. Pinnæ numerous, spreading, with a space their over width, more or less, between them, sessile and free at the base, where they are auricled and broadest, 3½–4½ in. long, 5–6 l. wide, uniformly lobed on both sides one-fourth to half the depth to the midrib, passing at the apex into the entire acuminato-bluntish point. Basal pair of lobes enlarged, the rest 2 l. wide and less deep to the sinus, rather obliquely rounded, and entire. Substance firm, pellucid, very dark green. Rachis channelled and with the ribs freely puberulous. Veins simple, curved, 3–5 to a side, the lowest pair united and sending a branch to the sinus, above which the next pair enter. Sori close to the midvein. Involucres small, fugacious. — Comes next *N. usitatum* Jenman, from which the smaller size, gradually reduced lower part of the fronds, narrower less acuminate pinnæ with enlarged basal lobes distinguish it.

Polypodium nimbatum, n. sp. — Stipites densely tufted, short or hardly any clear. Fronds erect or erecto-spreading, 2–3 in. long, 1½–2 l. broad, linear, narrowed at the base, the apex bluntish-pointed, deeply pinnatifid. Segments close, rounded, entire, ¾ to nearly 1 line deep and broad, broadly adnate and confluent at the base. Rachis stiff, filiform, black, concealed in the parenchyma, which eventually drops from it. Substance opaque, coriaceous; surfaces a dull brownish green; villose with spreading hairs; sori at the base of the lobes near the rachis, borne on the spur of the short dark veins, the dark brown hairs protruding between the sporangia. — Near *P. truncicola* Klotzsch and *P. organense* Mett.

P. Hartii, n. sp.—Rootstock very short and small, clothed with dark brown reticulated scales. Stipites tufted, few slender, from hardly any clear to 4 l. long. Fronds erect, linear, tapering both to apex and base, 3–5 in. long, 2–3 l. wide, almost fully pinnate. Segments very close, oblong, rounded at the end, the base obliquely adnate, $\frac{1}{3}$–$\frac{1}{2}$ l. wide, 1–1$\frac{1}{2}$ l. long, the same breadth at both ends, but the reduced basal ones deltoid. Rachis filiform, covered under the parenchyma on both sides, but prominent beneath, stiff. Texture subcoriaceous; surfaces slightly ciliate on the margins or naked, dark green, but paler beneath; a simple vein in each segment, that does not reach the apex. Sori elongated on the veins, sunk in a cavity which forms a ridge on the upper side of the segments, the sides of which are reflexed, but do not cover them.—This and the next species form a distinct group, marked by the sorus being elongated, and placed in a depression of the uninerved lobes. Found also in Dominica.

P. nutatum, n. sp. — Rootstock very small and short, clothed with rather squarrose reticulated scales. Stipites tufted, filiform, erect, dark, slightly ciliate or naked, $\frac{1}{2}$–$\frac{3}{4}$ in. long. Fronds erect, linear, tapering both to apex and base, 3–5 in. long, 1$\frac{1}{2}$–2 l. wide, pinnatifid almost to the stiffish thread-like rachis, which is covered by the parenchyma on the upper side, but not beneath. Segments obliquely deltoid-oblong, close, but shortly decurrent, $\frac{3}{4}$–1 l. long, less wide, blunt. Texture firm; surfaces naked or the margins and rachis beneath slightly ciliate, dark or brownish green, paler beneath. Veins simple in the lobes, not reaching the points. Sori roundish or rather elongate, medial on the veins, superficial or slightly depressed.

P. lasiolepis Mett.

1457 **P. Thomsonii,** n. sp. — Rootstock stout, upright, often a few inches high. Stipites cæspitose, erect, 1–2 ft. long, brown, clothed downwards with membranaceous brown scales, and mucous when young. Fronds 2–4 ft. long, 10–14 in. wide, oblong- or ovate-lanceolate, acuminate, somewhat shortly reduced at the base. Rachis channelled, greyish puberulous or pubescent, and pale-coloured. Pinnæ spreading, numerous, contiguous above, subdistant below, sessile, with a subulate gland at the base beneath, 6–8 in. long, 1–$\frac{1}{4}$ in. wide, oblong-lanceolate, acuminate, with a serrato-entire point, the 2–3 lower ones reduced half or more, and often deflexed, pinnatifid to half a line of the costæ. Segments numerous, close, straight, linear-oblong and round-ended, confluent, but not dilated at the equal-sided base, 6–7 l. long, 1$\frac{1}{2}$–2 l. wide, flat, with entire margins. Texture thin, membrano-chartaceous, pellucid. Surfaces nearly naked, puberulous or ciliate on the costæ and ribs, and slightly glandulose beneath; colour pale but vivid green. Veins simple, slightly oblique, pellucid while fresh, 12–15 to a side. Sori medial or nearer the midrib, brown, constantly distinct, at length dispersed. — Near *P. decussatum* L. and *P. Percivalii* Jenman. It commemorates the name of Mr. Robert Thomson, to whom belongs the credit of forming the Cinchona Plantations and the several branches of the Botanical Department, except the Old Bath Garden, of which a remnant still exists.

Acrostichum inæqualifolium, n. sp. — Rootstock thick as a quill or less, several inches long, horizontal, densely clothed with dark chestnut-coloured scales having paler margins. Stipites scattered, erect, 2–3 or 4 in. long, rather freely clothed at first with spreading, scattered, brown, but very deciduous scales. Fronds erect, linear-lanceolate, tapering equally at the apex and base, 4–10 in. long, ½–1¼ in. wide, coriaceous, the veins free, forked from the base, close, obscure; surfaces dark green, paler beneath, clothed with scattered, very minute, fimbriate, pale-edged scales, less abundant and more fibrillose on the upper side. Fertile fronds conform, but on stipites usually twice as long as the barren. Margins cartilaginous-edged, and rather reflexed when dry.—Intermediate between *A. simplex* and *A. chartaceum*, and bearing about the same relation to the latter that *A. conforme* does to *A. latifolium*.

A. (*Elaphoglossum*) *Herminieri* Bory.

A. (Elaphoglossum) **viridifolium,** n. sp. — Rootstock short, rather stout, oblique or decumbent, densely clothed with small ferruginous linear scales. Stipites subtufted, erect, stramineous, 1–3 in. long, channelled. Fronds linear-lanceolate, 7–9 in. long, 1–1⅓ in. wide, tapering both up and down, but more so downwards, and passing insensibly into the petiole; the apex pointed, but obtuse; margins even or repand. Surfaces glabrous, but with laxly scattered very minute peltate scales over the under side. Texture coriaceous. Colour bright green. Veins fine, close, once forked, nearly concealed. Fertile fronds much narrower, nearly or quite as long, on stipites twice as long. — This comes nearest to *A. flaccidum* Fee, but is distinguished by its longer petioles, coriaceous texture, finer and closer venation, and the obtuse pointed apex of the fronds. The petioles are scaly at first, but early become quite naked. The midrib is prominent beneath, channelled above, and, with the petioles, straw-colour when dry.

Selaginella caribensis, n. sp.—Fronds prostrate, very delicate, 1–2 in. long, usually leafy to the base, the shorter simple, the longer with short alternate mostly distant branches, which are 1–6 l. long by 1–1½ l. wide over the leaves. Lateral leaves contiguous, apart, or the lower ones subdistant, about ½ l. long and rather less wide, point rounded or subacute, base subcordate, the upper auricled side ciliate and deeper than the rather contracted lower; intermediary leaves minute, apart, aristato-acuminate, subcordate, the outer side longer than the inner, the margins slightly ciliate. Spikes about 1 l. long, the bracts not distinctly keeled, ciliate-margined, lax or spreading, and revealing the sporangia.—A very delicate species, found in the forests on trees and logs at 5000–7000 ft. alt. It is intermediate between *S. confusa* and *S. rotundifolia*.

S. setigera, n. sp.—Stems rooted at the base, suberect. Fronds compact, variable in shape, the pinnate branches short or freely and often unequally extended, casually terminating in a slender unbranched flagelliform radicant tail. Lateral leaves oblong, narrow, imbricating, obliquely cordate at the base, the point acute, ¾ l. long, ¼ l. wide; upper margin setiferous about half its length from the

base; intermediary leaves ovate, cuspidate, imbricating, ¼ l. long, both margins setiferous. Texture herbaceous; colour dark green above, paler beneath. Spikes 4-stichous, short, rather flattened, decrescent; bracts keeled; sporangia rather large.—*Wilson*, No. 136. *Morris*, No. 503, Herb. Kew. Very distinct among the Jamaica species. Its nearest affinity is with *S. rhizophora* Baker of Panama.

A SYNOPSIS OF THE *RHIZOCARPEÆ*.

By J. G. Baker, F.R.S., F.L.S.

(Continued from p. 101).

Suborder 2.—Marsilieæ.

Conceptacles always double, the outer coriaceous and dehiscent, the inner membranous and indehiscent, containing sporangia of both kinds.

3. Marsilea Linn.*

Conceptacles oblong or globose, coriaceous in texture, placed in the axils of the leaves or rarely on their petiole, dehiscing finally along the ventral suture into two valves and emitting a mucilaginous placental cord, upon which are spaced out numerous oblong-cylindrical sori with a membranous coat, each sorus containing numerous microsporangia holding numerous microspores, and few macrosporangia holding solitary macrospores. — Aquatic or subaquatic, with a slender wide-creeping rhizome, the leaves produced singly or in tufts from its nodes, each consisting of a petiole and four sessile equal spreading deltoid-cuneate or oblanceolate leaflets, with flabellate anastomosing veins.

Pedicels many, short, springing from the petiole one above another . . . . . Sp. 1.
Pedicels 2–4-nate, rarely solitary, adnate to the base of the petioles . . . . . Sp. 2–5.
Pedicels 2–6-nate, rarely solitary, slightly connate at the base, quite free from the petiole . . Sp. 6–9.
Pedicels single.
Pedicels very short.
Leaflets oblanceolate . . . . . Sp. 10, 11.
Leaflets deltoid . . . . . Sp. 12–21.
Pedicels at least as long as the conceptacle.
Leaflets without pellucid streaks. Conceptacles mostly horizontal, adnate to the tip of the pedicel . . . . . Sp. 22–36.
Leaflets with pellucid streaks. Conceptacles mostly erect, not adnate to the tip of the pedicel . . . . . Sp. 37–40.

---

* See A. Braun's monographs as cited under the genus *Pilularia*, and a later paper in the 'Berlin Monatsbericht' for 1872, pp. 668–679, reprinted in Journ. Bot. 1873, p. 55.

1. M. POLYCARPA Hook. & Grev. Ic. Fil. t. 160. — *M. brasiliensis* Mart. Ic. Crypt. 122, t. 73.—Large, aquatic, glabrous, wide-creeping. Petiole ½–1 ft.; leaflets thin, deltoid, ½–1 in. long and broad; outer border rounded and entire. Conceptacles 10–20, placed on short curved pedicels arising from the petiole one above another some distance from its base, nearly globose, 1-12th in. long, not compressed, glabrescent, without border or basal teeth, its veins anastomosing midway between the sutures. Sori about 10.

Hab. Tropical America and Society Islands. Var. *mexicana* A. Br. is a form with fewer conceptacles, beginning lower down on the petiole; *M. picta* Fée, a variety with the leaves marked with conspicuous brown streaks in the areolæ formed by the veinlets; and *M. subangulata* A. Br., a small variety with fewer rather angular tomentose concaptacles. *M. Stratiotes* A. Br., gathered by Spruce on the Lower Amazon, is perhaps a robust variety of *polycarpa* with an unusually stout rhizome and petiole, but the fruit is entirely unknown.

2. M. QUADRIFOLIATA Linn. Sp. 1563; Schk. Crypt. t. 173.—Large, aquatic, wide-creeping. Petiole 3–6 in.; leaflets deltoid, glabrous, ½–¾ in. long; outer edge rounded and entire. Pedicels 2–4-nate, ½–1 in. long, erect, connate with each other, and adnate to the base of the petiole and upper part of the base of the conceptacle. Conceptacles round-oblong, ⅛–⅙ in. long, usually glabrescent when mature, not bordered; basal teeth minute. Sori 16–20.

Hab. Central Europe to Japan and the North of India. Rare in the United States (New England).

3. M. BROWNII A. Br. in Berl. Monat. 1863, 418. — *M. quadrifolia* R. Br. Prodr. 167. — Aquatic, wide-creeping, glabrous, with habit of *M. quadrifoliata*. Petiole reaching 6–9 in.; leaflets deltoid, ½–1¼ in. long and broad; outer edge rounded, entire. Pedicels 1–3-nate, usually erect, ½–¾ in. long, shortly connate, obscurely adnate to the base of the petiole, adnate to the upper part of the base of the horizontal or deflexed tomentose or glabrescent globose-oblong conceptacle, which is ⅛ in. long, without basal teeth. Sori about 15.

Hab. New South Wales, *R. Brown*! *R. Cunningham*!

4. M. MACROPUS Engelm. in Sillim. Journ. ser. 2, iii. 56. — Large-sized, wide-trailing, with habit of *M. quadrifoliata*. Petioles reach 6–8 in.; leaflets deltoid, ½–¾ in. long and broad, slightly silky; outer edge rounded, entire. Pedicels 2–4-nate, erect, 3–4 times as long as the conceptacles, connate one-fourth to one-third of their length, and adnate to the base of the petiole and conceptacle. Conceptacle oblong, obliquely ascending, tomentose, 1-5th in. long; basal teeth small. Sori about 20.

Hab. Texas, *Lindheimer* iii. 573!

5. M. DEFLEXA A. Br. in Berl. Monatber. 1863, 421; Kuhn in Fl. Bras. i. 652, tab. 80, figs. 6–8.—*M. striata* Mett. in Crypt. Nov. Gran. 394. — Aquatic, glabrous, wide-creeping. Petiole 6–8 in. long; leaflets deltoid, about ½ in. long and broad; outer edge rounded and entire. Pedicels 2-nate, ¼ in. long, not connate,

inserted on the petiole above its base, ascending or deflexed, inserted into the middle of the base of the obliquely-placed conceptacle, which is oblong, unbordered, 1-5th in. long, without basal teeth. Sori about 15.

Hab. Brazil, in marshes south of Oeiras, *Gardner* 2760! *M. striata* Mett., found by Triana in New Granada, has brown lines in the centre of the areolæ of its leaves, like those of *M. polycarpa* var. *picta*.

6. M. MINUTA Linn. Mant. 308. — *M. erosa* Willd. Sp. v. 540.— *M. dentata* Roxb. — Subterrestrial or aquatic, both with a wide-creeping rhizome, the latter not distinguishable, when sterile, from *M. quadrifoliata*, the former with petioles 1–2 in. long, and nearly or quite glabrous leaflets $\frac{1}{4}$–$\frac{1}{2}$ in. long, conspicuously toothed on the outer edge. Pedicels 2–6-nate, stiffly erect, $\frac{1}{8}$–$\frac{1}{6}$ in. long, obscurely connate at the base, adnate to the whole base of the conceptacle. Conceptacle horizontal, glabrescent, about as broad as long ($\frac{1}{8}$–$\frac{1}{6}$ in.), truncate at the base, rounded at the apex, distinctly bordered; basal teeth both distinct, the upper one the largest. Sori 10–12.

Hab. Plains of India. Var. *Zollingeri* A. Br., from Java, differs by its subentire leaflets, tomentose mature conceptacle, and less distinct teeth. *M. crenata* Presl. Rel. Hænk. tab. 12, fig. 3, from the Philippine Islands, is perhaps the same form. A plant found by C. Wright in the Loo-Choo group is like it, but all the pedicels are solitary. *M. brachycarpa* A. Br. in Berl. Monat. 1863, 420, is a form gathered in Pegu by MacClelland, with small strongly-toothed leaflets of firm texture, 1-12th to 1–8th in. long on $\frac{1}{4}$–$\frac{1}{2}$ petioles, and smaller conceptacles with about 6 sori. Var. *Wightii* Baker (*M. ægyptiaca* Wall. Cat. 7096, non Willd.) connects it with the type. *M. brachypus* A. Br. in Berl. Monat. 1863, 421, gathered in the Neilgherries by Dr. Wight, is a variety with silky leaves, and 2–3-nate tomentose conceptacles on short pedicels. *M. gracilenta* A. Br. *loc. cit.*, frem the Coneau, is a form intermediate between *brachypus* and the type, with longer pedicels than in the former, and less silky leaves.

7. M. CRENULATA Desv. Prodr. 177.—*M. vulgaris* Bory, ex parte. *M. microcarpa* A. Br.—*M. crenata* A. Br., ex parte.— Subterrestrial or aquatic, with a wide-creeping rhizome, the latter, when sterile, not distinguishable from *M. quadrifoliata*, the former with petioles 1–4 in., and deltoid leaflets $\frac{1}{8}$–$\frac{1}{4}$ in. long, distinctly crenate on the outer edge. Pedicels 2–4-nate, stiffly erect, $\frac{1}{8}$–$\frac{1}{4}$ in. long, connate at the base, free from the petiole, adnate to the whole base of the conceptacle. Conceptacle oblong-quadrate, horizontal, 1-12th to 1-8th in. long, glabrous or slightly silky, unbordered; basal teeth small. Sori about 10.

Hab. Mauritius and Bourbon. Only differs from *M. diffusa* by its distinctly crenate leaflets, and the smaller teeth of the base of the conceptacle.

8. M. DIFFUSA Leprieur; A. Br. in Flora, 1839, 300. — *M. vulgaris* Bory, ex parte. — Subterrestrial or aquatic, both with a wide-creeping rhizome, the latter, when sterile, indistinguishable

from *M. quadrifoliata*, the former with petioles 2–4 in. long and glabrous deltoid leaflets about ½ in. long and broad, entire or obscurely crenulate round the outer edge. Pedicels 2–4-nate, stiffly erect, ⅛–⅙ in. long, free from the petiole, obscurely connate at the base, adnate to the whole base of the conceptacle. Conceptacle oblong-quadrate, ⅛–⅙ in. long, horizontal, glabrescent, unbordered; basal teeth both distinct. Sori 10–12.

Hab. Algeria, Canaries, Mascaren Isles, and spread throughout Tropical Africa. Very near *M. minuta*, from which it differs by its unbordered conceptacles and usually entire leaflets. *M. cornuta* A. Br. in Berl. Monatber. 1870, 728, gathered by Welwitsch in Angola, is a form with short pedicels and petioles, crenulate leaflets, and the teeth of the base of the conceptacle very distinct, the top one hooked.

9. M. SENEGALENSIS A. Br. in Flora, 1839, 300. — Middle-sized, wide-trailing, subterrestrial. Petiole 1–2 in.; leaflets deltoid, slightly silky, ¼–½ in. long, distinctly crenate round the outer edge. Pedicels 2-nate, stiffly erect, ⅛–⅙ in. long, obscurely connate at the base, free from the petiole, aduate to the whole base of the conceptacle. Conceptacle nearly square, horizontal, silky, unbordered, 1-12th in. long, persistently silky; basal teeth minute. Sori 8–10.

Hab. Senegal. Intermediate between *M. diffusa* and *ægyptiaca*.

10. M. ANGUSTIFOLIA R. Br. Prodr. Austr. 167. — Aquatic, large or middle-sized. Petiole reaching 1 ft.; leaflets oblanceolate, obtuse, ½–1¼ in. long, ⅛–⅓ in. broad, obscurely crenate on the outer edge, glabrous. Pedicels solitary, erect, very short, adnate to the upper part of the base of the conceptacle. Conceptacle oblong, horizontal, ⅙–¼ in. long, unbordered, persistently tomentose; basal teeth obscure. Sori about 20.

Hab. North Australia.

11. M. TENUIFOLIA Engelm.; A. Br. in Berl. Monatber. 1863, 425. — Middle-sized, nearly or quite glabrous, with a slender wide-creeping rhizome. Petiole 3–4 in.; leaflets oblanceolate, about ½ in. long, 1-12th in. broad, with a rounded entire outer edge. Pedicels short, solitary, erect, adnate to the upper part of the base of the conceptacle. Conceptacle oblong, horizontal, unbordered, 1-5th in. long, persistently tomentose; basal teeth distinct. Sori about 20.

Hab. Texas, *Lindheimer*, fasc. iv. No. 745. *M. minuta* Fourn. in Bull. Soc. Bot. France, 1880, p. 329, gathered in Mexico by Schaffner, is said to be closely allied to this species.

12. M. PUBESCENS Tenore Prodr. Fl. Neap. Suppl. i. 70; A. Br. in Expl. Sc. Alger. t. 38.—*M. Fabri* Dunal in Ann. Sc. Nat. ser. 2, ix. 115, t. 13. — Middle-sized, subterrestrial or aquatic, the latter short-creeping, with copious silky buds in the axils of the leaves. Petiole 1 in. to 1 ft.; leaflets deltoid, usually thinly silky, ⅙–½ in. long; outer edge rather rounded, entire. Conceptacles sessile, crowded in two regular imbricating rows on the rhizome, globose-obovoid, ⅙ in. long, silky, unbordered, horizontal, with the pedicel adnate to the upper part of its base; basal teeth obscure. Sori about 10.

Hab. Mediterranean region; South France, Italy, Morocco, Algeria.

13. M. STRIGOSA Willd. Sp. v. 539.—Middle-sized, subterrestrial or aquatic, the former tufted, the latter short-creeping. Petiole 1–3 in.; leaflets deltoid, obscurely silky or glabrescent, ¼–½ in. long; outer edge slightly rounded, entire. Conceptacles sessile, crowded, oblong, ⅙ in. long, with the pedicel adnate to the upper part of the base, slightly silky when mature, not bordered, not arranged on the rhizome in two regular imbricating rows; basal teeth obscure. Sori 8–10.

Hab. S.E. European Russia and Western Siberia. Very near *M. pubescens*, with which Milde unites it.

14. M. FIMBRIATA Thoun. & Schum. Besk. Guin. 461. — Habit of *M. quadrifoliata*. Petiole ½–1 ft.; leaflets deltoid, about an inch long, glabrous above, strigillose beneath; outer edge entire. Conceptacle globose, size of anise-seed, solitary, subsessile, persistently tomentose.

Hab. Guinea, *Thouning*. Known to me only from an incomplete description.

15. M. NUBICA A. Br. in Berl. Monatber. 1863, 432. — Middle-sized, subterrestrial, short creeping, glabrous. Petiole 1–1½ in. long; leaflets deltoid, ¼–⅓ in. long and broad; outer edge rounded, entire. Pedicels solitary, erect, very short, adnate to the base of the conceptacle, finally turning black. Conceptacle nearly square, horizontal, 1-12th in. diam., unbordered, bright black, with a loose outer skin; basal teeth obsolete. Sori about 8.

Hab. Kordofan, *Kotschy* 126! This and *M. gymnocarpa* differ from all the other species by their glossy black conceptacles with a loose wrinkled epidermis.

16. M. HIRSUTA R. Br. Prodr. Austral. 167. — Large or middle-sized, aquatic or subterrestrial. Petiole 1–4 in. long in the subterrestrial form; leaflets ⅙–½ in. long, silky; outer border rounded and entire. Pedicels solitary, very short, erect, adnate to the upper part of the base of the conceptacle. Conceptacle horizontal, obliquely round-oblong, the dorsal suture nearly straight, 1 6th to 1-5th in. loug, persistently tomentose, unbordered; basal obscure. Sori about 15.

Hab. North Australia, Queensland, and N. S. Wales. *M. exarata* A. Br. in Berl. Monatber. 1870, 732, is a wide-trailing terrestrial form, with leaves and fruits in dense tufts at the distant nodes, and small silky leaflets of firm texture.

17. M. VILLOSA Kaulf. Enum. Fil. 272.—Middle-sized or large, subterrestrial or aquatic, with deltoid leaflets, with rounded entire outer border, thinly silky, except in the aquatic. Pedicel short, solitary, erect, adnate to the upper part of the base of the conceptable. Conceptacle round-oblong, persistently silky, unbordered, about 1-5th in. long, one-fifth longer than broad; basal teeth prominent, the upper one hooked, the two separated by a narrow acute sinus. Sori about 15.

Hab. Sandwich Islands. Very near *M. vestita*.

18. M. VESTITA Hook. & Grev. Ic. Fil. t. 159. — Subterrestrial,

tufted or wide-creeping. Petiole 1–6 in. long; leaflets deltoid, $\frac{1}{8}$–$\frac{1}{2}$ in. long, thinly clothed with adpressed brown hairs; outer edge rounded and entire. Pedicels short, solitary, erect, adnate to the upper part of the base of the conceptacle. Conceptacles horizontal, round-oblong, persistently tomentose, unbordered, 1-6th to 1-5th in. long; basal teeth prominent. Sori about 15.

Var. *M. mucronata* A. Br. in Sillim. Journ. ser. 2, iii. 55.— Leaflets and conceptacles less silky. Pedicels short. — *M. brevipes* Nutt.

Var. *M. uncinata* A. Br. in Flora, 1839, 300. — More robust. Pedicel often longer than the conceptacle, of which the basal teeth are very distinct, the upper one hooked. Sori 20–24.

Hab. British Columbia, California and Western United States down to Texas, New Mexico, and Mexico.

19. M. MEXICANA A. Br. in Berl. Monatber. 1870, 747.—Middle-sized, subterrestrial, with leaves and pedicels clustered at the contiguous nodes. Petiole 1–4 in.; leaflets deltoid, slightly silky, $\frac{1}{4}$–$\frac{1}{2}$ in. long; outer edge entire, a little rounded. Pedicels very short, ascending or deflexed, adnate to the upper part of the base of the conceptacle. Conceptacle round-oblong, horizontal, $\frac{1}{6}$ in. long, persistently tomentose, unbordered; basal teeth none or very obscure. Sori 16–18.

Hab. In Mexico, near Talisco, *Beechey*! San Luis Potosi, *Parry & Palmer* 1010!

20. M. ERNESTI A. Br. in Berl. Monatber. 1870, 746.—*M. striata* Ernst, non Mett. — Aquatic or subterrestrial, middle-sized, with crowded or widely-separated nodes. Petiole 1–6 in.; leaflets deltoid, glabrous or obscurely silky, 1-12th to $\frac{1}{2}$ in. long and broad; outer edge rounded, entire. Pedicels solitary, very short, erect or deflexed, adnate to the upper part of the base of the conceptacle. Conceptacle horizontal, round-oblong, 1-5th in. long, persistently tomentose; basal teeth none or very obscure. Sori 15–20.

Hab. Caracas, *Ernst*!

21. **M. concinna,** n. sp. — Subaquatic, wide-trailing, small or middle-sized. Petiole $\frac{3}{4}$–$1\frac{1}{2}$ in.; leaflets deltoid, glabrous or slightly silky, $\frac{1}{6}$–$\frac{1}{3}$ in. long and broad; outer edge rounded, entire. Pedicels solitary, erect, $\frac{1}{8}$–$\frac{1}{6}$ in. long, inserted in the middle of the base of the conceptacle. Conceptacle oblong, horizontal, $\frac{1}{6}$ in. long, persistently tomentose, unbordered, without basal teeth. Sori about 10.

Hab. Paraguay, in marshes near Assumption, *Balansa* 1127!

22. M. BURCHELLII A. Br. in Berl. Monatber. 1863, 429. — *M. pumila* E. Meyer. — *M. pusilla* A. Br. — *M. minuta* and *filiformis* Burch. — Subterrestrial or aquatic, wide-trailing, the former (*M. minuta* Burch.) with petioles $\frac{1}{2}$–1 in., and silky deltoid leaflets 1-12th in. long, of firm texture, entire or emarginate on the outer edge; the latter (*M. filiformis* Burch.) with petioles 3–4 in. long, and entire glabrous leaflets $\frac{1}{4}$–$\frac{1}{3}$ in. long and broad. Pedicels solitary, stiffly erect, $\frac{1}{4}$–$\frac{1}{3}$ in. long, adnate to nearly the whole of the base of the conceptacle. Conceptacle horizontal, nearly square, 1-12th in. diam., persistently tomentose, unbordered; upper basal tooth distinct; lower obsolete.

Hab. Cape Colony, as far north as the Transvaal.

23. M. BILOBA Willd. Sp. Plant. v. 540. — *M. glomerata* Presl. — Subterrestrial or aquatic, wide-trailing, the former minute, with petioles ½–1 in. and silky leaflets ⅛–⅙ in. long; the latter with glabrous leaflets ½ in. long and broad; the leaflets in both states deltoid, with a deeply-lobed outer edge. Pedicels solitary, erect, about as long as the conceptacle, adnate to its base. Conceptacle nearly square, horizontal, 1-12th in. long, persistently silky; upper basal tooth distinct, lower obscure. Sori 8–10.

Hab. Cape Colony.

24. M. CAPENSIS A. Br. in Berl. Monatber. 1863, 428.—Middle-sized, aquatic or subterrestrial. Petioles reach ½ ft. long; leaflets deltoid, thinly silky or glabrous, ¼–½ in. long; outer edge entire or emarginate. Pedicels solitary, erect, ⅛–⅙ in. long, adnate to the base of the conceptacle. Conceptacle nearly square, horizontal, tomentose or glabrescent, unbordered, 1-12th to 1–8th in. long; upper basal tooth distinct, lower nearly or quite obsolete. Sori 10–12.

Hab. Cape Colony. *M. villosa* Burchell MSS., of which the fruit is unknown, differs by its densely silky leaves, and nodes furnished with large buds densely coated with ferruginous shining subulate paleæ.

25. M. MACROCARPA Presl in Abh. Bohm. Ges. Wiss. iii. 580.—*M. Dregeana* A. Br. in Berl. Monatber. 1863, 428. — Large, wide-trailing, aquatic, glabrous. Petiole ½–1 ft.; leaflets deltoid, ½–¾ in. long and broad; outer edge entire or crenate. Pedicels solitary, erect, ½–1 in. long, adnate to nearly the whole base of the conceptacle. Conceptacle horizontal, oblong-quadrate, persistently tomentose, ¼ in. long, unbordered; basal teeth obsolete. Sori about 20.

Hab. Cape Colony and Natal.

26. M. ROTUNDATA A. Br. in Kuhn Fil. Afric. 200. — Aquatic, glabrous, moderately wide-creeping. Petiole reaching ½ ft.; leaflets deltoid, ⅓–½ in. long; outer edge rounded and entire. Pedicels solitary, erect or spreading, about ½ in. long, adnate to the base of the conceptacle. Conceptacle round-oblong, horizontal or obliquely ascending, ⅙ in. long, unbordered, glabrescent or slightly silky; basal teeth very obscure. Sori about 15.

Hab. Angola, in the subtemperate region of the province of Huilla, *Welwitsch* 171! Very near the Cape *M. macrocarpa*.

27. M. SUBTERRANEA Leprieur; A. Br. in Flora, 1839, 301.—Habit of *M. quadrifoliata*; leaflets large, with a rounded entire outer edge. Pedicel solitary, deflexed, 2–3 times as long as the conceptacle, adnate to its base. Conceptacle forming an obtuse angle with the pedicel, round-oblong, ⅛ in. long, compressed, distinctly bordered; basal teeth close, minute. Sori about 10.

Hab. Senegal, *Perottet* 996.

28. M. GIBBA A. Br. in Berl. Monat. 1870, 741.—Aquatic, wide-trailing, glabrous, undistinguishable when sterile from *M. quadrifoliata*. Petiole 4–6 in. long; leaflets deltoid, ⅓–½ in. long, with a tubercled epidermis; outer edge rounded, entire. Pedicels solitary, arcuate from a decumbent base, 4–5 times as long as the conceptacle,

adnate to its base. Conceptacle oblong, unbordered, oblique, ascending or deflexed, 1-6th to 1-5th in. long; upper tooth distinct, lower obscure. Sori about 15.

Hab. Central Africa, in Bongo-land, *Schweinfurth* 2147 !

29. M. GYMNOCARPA Leprieur; A. Br. in Flora, 1839, 300.—*M. leiocarpa* Bory MSS. — Habit of *M. nubica*. Leaflets narrowly deltoid, nearly glabrous; outer edge rounded, entire. Pedicels solitary, erect, brownish, rather longer than the conceptacle, adnate to its base. Conceptacle nearly square, $\frac{1}{8}$ in. diam., much compressed, unbordered, glabrous, bright black, with a loose outer skin, placed rather obliquely (declinate) as regards the pedicel; basal teeth obscure. Sori 8–10.

Hab. Senegal, *Leprieur*, *Perottet*. Differs mainly from *M. nubica* by its longer pedicel.

30. M. ÆGYPTIACA Willd. Sp. v. 540; Delile, Fl. Egypt. 253, t. 50. —Subterrestrial or aquatic, very variable in size. Petiole in the aquatic form $\frac{1}{2}$–1 ft.; leaflets deltoid, $\frac{1}{2}$–$\frac{3}{4}$ in. long, entire; in the subterrestrial form much shorter; leaflets $\frac{1}{4}$–$\frac{1}{2}$ in. long, often thinly silky, deeply crenate on the outer edge. Pedicels solitary, erect, $\frac{1}{4}$–$\frac{1}{3}$ in. long, adnate to the whole base of the conceptacle, which is horizontal, nearly square, 1-12th to 1-10th in. long, usually silky, not bordered, with the upper corner of the base produced into an obscure tooth, Sori about 6.

Hab. Lower Egypt and Astracan.

31. **M. condensata,** n. sp. — Subterrestrial, middle-sized, densely tufted. Petioles $\frac{1}{2}$–$1\frac{1}{2}$ in. long; leaflets deltoid, firm in texture, thinly silky, $\frac{1}{4}$–$\frac{1}{3}$ in. long, crenate on the outer edge. Pedicels in a tuft with the leaves, free to the base, $\frac{1}{8}$–$\frac{1}{4}$ in. long, stiffly erect, adnate to the whole base of the conceptacle. Conceptacle horizontal, suborbicular, densely silky, unbordered, $\frac{1}{8}$ in. long; basal teeth none or very obscure. Sori about 10.

Hab. Scinde, *Herb. Dalzell* !

32. M. QUADRATA A. Br. in Berl. Monatber. 1870, 745.—Small, terrestrial, densely tufted. Petiole 1–2 in. long; leaflets deltoid, rather silky, $\frac{1}{6}$–$\frac{1}{3}$ in. long, crenate on the slightly rounded outer edge. Pedicels solitary, erect, $\frac{1}{4}$–$\frac{1}{3}$ in. long, adnate to the whole base of the conceptacle. Conceptacle nearly square, glabrescent, horizontal, unbordered, 1-12th in. long; basal teeth distinct. Sori 5–6.

Hab. Borneo, *Low* ! Very near *M. ægyptiaca*.

33. M. DRUMMONDII A. Br. in Linnæa, xxv. 721.—*M. macropus* Hook. Ic. t. 909; Gard. Ferns, t. 63.—*M. Howittiana, sericea, Nardu, macra, oxaloides*, and *hirsutissima* A. Br. in Berl. Monatber. 1870, 734–739. — Large, subterrestrial or aquatic. Petiole often $\frac{1}{2}$ ft. or more long in subterrestrial forms; leaflets deltoid, usually silky, $\frac{1}{2}$–$\frac{3}{4}$ in. long; outer edge rounded, entire or crenate. Pedicels 1–2 in. long, stiffly erect, adnate to the upper part of the base of the conceptacle. Conceptacles oblique oblong, not bordered, with the dorsal suture nearly straight, $\frac{1}{4}$–$\frac{1}{3}$ in. long, obliquely ascending, cuspidate, with a pair of small teeth at the upper corner of the base. Sori 15–20.

Var. *M. Muelleri* A. Br. in Linnæa, xxv. 721. — *M. salvatrix* Haustein. — Conceptacle more regularly oblong, the dorsal suture more rounded.

Var. *M. elata* A. Br. in Ind. Sem. Hort. Berol 1867, App. 3.— Conceptacle erect, with a pedicel 2½–3 in. long.

Hab. Central and Southern Australia.

35. M. Berteroi A. Br. in Berl. Monatber. 1870, 747. — Very near *M. mexicana*. Leaflets smaller and glabrous. Pedicels longer, curved, decumbent, sometimes twice as long as the conceptacle, adnate to the upper part of its base. Conceptacle oblong, persistently tomentose, 1-5th in. long; basal teeth obscure. Sori about 20.

Hab. St. Domingo, gathered by Bertero.

34. M. mutica Mett. in Ann. Sc. Nat. Ser. 4, xv. 88.—Aquatic, middle-sized, wide-creeping. Petiole 6–8 in. long; leaflets deltoid, glabrous, ½ in. long; outer edge rounded, entire. Pedicels solitary, ascending, ¼–⅓ in. long, scarcely at all adnate to the base of the conceptacle, inserted at its lower corner. Conceptacle horizontal, unbordered, glabrescent, ⅙–⅛ in. long, obovoid-oblong; basal teeth obsolete. Sori about 15.

Hab. New Caledonia, *Vieillard* 1698! We have aquatic forms of similar habit, but without fruit, from Tahiti and Fiji, and another from New Caledonia, with entire leaflets 1¼–1½ in. long and broad.

36. M. ancylopoda A. Br. in Berl. Monatber. 1863, 434.— Wide-trailing, middle-sized or large, aquatic or subterrestrial, the latter with leaves rather silky. Petiole 1–4 in.; leaflets deltoid, reaching ½–¾ in. long and broad; outer border rounded and entire. Pedicels solitary, abruptly deflexed, 1-6th to 1-5th in. long, adnate to the middle of the base of the conceptacle. Conceptacle obovoid-globose, unbordered, tomentose, 1-5th in. long; basal teeth none or very indistinct. Sori about 20.

Hab. Marshes in Ecuador, near Guayaquil, *Jameson* 394! *Spruce* 6550!

37. M. coromandelica Burm. Fl. Ind. tab. 62, fig. 3. — *M. coromandeliana* Willd. Sp. Plant. v. 539. — *M. minuta* var. *coromandeliana* Linn. Mant. 308.—Small, aquatic or subterrestrial, glabrous in all its parts. Petiole ½–3 in. long; leaflets deltoid, 1-12th to 1-3rd in. long; outer edge rounded, entire, Pedicels ½–¾ in. long, free, filiform, erect, inserted in the middle of the base of the conceptacle. Conceptacle oblong, erect, ⅙ in. long, distinctly bordered and grooved down the face; basal teeth distinct. Sori 10–12.

Hab. Plains of Peninsular India, and discovered recently by Dr. I. B. Balfour in Socotra. Species 37–40 differ from all the other species by having pellucid streaks in the areolæ of the leaflets running down their long diameter.

38. M. trichopoda Leprieur; A. Br. in Flora, 1839, 300.— Small, subterrestrial, wide-trailing, glabrous. Petiole 1–1½ in. long; leaflets deltoid, about ¼ in. long; outer edge rounded and entire. Pedicels solitary, very slender, ascending, about ½ in. long, inserted into the middle of the base of the erect or slightly oblique

round-oblong distinctly-bordered conceptacle, which is 1-12th to 1-8th in. long, distinctly grooved across the faces, and furnished at the base with two obscure teeth. Sori 8–10.

Hab. Senegal, *Heudelot* 548! Very near the Asiatic *M. coromandelica*, from which it differs by its smaller conceptacles, broader in proportion to their length, and less distinct basal teeth.

39. M. MUSCOIDES Leprieur; A. Br. in Flora, 1839, 300. — *M. microphylla* Welw. MSS. — Minute, subterrestrial, wide-trailing. Petiole very slender, 1–1½ in. long; leaflets deltoid, glabrous, ⅛–⅙ in. long; outer edge rounded, entire. Pedicels solitary, erect, filiform, ⅓–½ in. long, inserted into the middle of the base of the distinctly-bordered erect round-oblong glabrous conceptacle, which is distinctly grooved across the sides, and furnished at the base with two minute teeth. Sori 4–6.

Hab. Senegal, *Leprieur*. Angola, *Welwitsch* 109! 175! Closely allied to the two preceding species.

40. M. DISTORTA A. Br. in Berl. Monatber. 1863, 433.—Middle-sized. Leaflets deltoid, glabrous, crenulate on the outer edge. Pedicel 2½–3 times as long as the conceptacle, very shortly adnate to its base, solitary, slender, spreading or deflexed, flexuose, abruptly incurved at the tip. Conceptacle obovoid from a narrow base, little compressed, not margined, about ⅙ in. long, half as long again as broad, tomentose till maturity. Sori 12–14.

Hab. Senegal, *Lelievre*, *Leprieur*.

(To be continued.)

SHORT NOTES.

SUFFOLK MOSSES.—I have to make one or two corrections and additions to the list I gave (Journ. Bot. 1885, p. 311), supplementing the Rev. E. N. Bloomfield's list. *Orthotrichum tenellum* must be expunged. The specimens I sent, and which I had not examined, were a small form of *O. affine*; and though I feel sure that I gathered true *O. tenellum* near Southwold, without specimens it cannot be considered as recorded. I have also to add *Didymodon luridus*, on stones, Dunwich; and *Pottia crinita*, sandy bank, Southwold, named for me by Mr. E. M. Holmes. My *Barbula papillosa* must not be looked upon as the first record for the county, as the Rev. E. N. Bloomfield has since found specimens existing in the herbarium of Sir Charles Bunbury. I may add that Dr. Braithwaite has confirmed *Campylopus paradoxus* from Walberswick.—H. N. DIXON.

ABNORMAL WOUNDWORT.—I wish to record a variation which I have discovered in a specimen of *Stachys sylvatica*. All the flowers are sessile except those of one whorl, which are supported on two pedicels, one in the axil of each bract. One pedicel supports six flowers, the other three. The middle flower of the three is remarkably abnormal, the corolla being 6-lobed lobes; equal, undivided, except that the lower or anterior lobe is slightly notched at the extremity; stamens six, alternate to the lobes of the corolla,

smaller than usual. The corolla is of the ordinary colour, the anterior part being variegated with white. The calyx has the usual number of teeth, and the ovary, style and stigma are normal. All the other flowers on the plant are normal. The bract in the axil of which the abnormal flower occurs is very large, measuring just five inches in length, exclusive of the petiole.—Arthur W. Harrison.

Peloria in Ophrys apifera Huds.—Last year my friend Mr. T. Colgate, Jun., of Glynde, kindly directed me to a spot on the chalk downs near this town, where he had met with a very curious variety of the bee orchis. On visiting the locality I succeeded in obtaining two or three specimens and left others. Mr. G. Nicholson, of Kew, to whom I sent a specimen, informed me that it was a peloria form. This year the variety has again occurred, and I have seen some eight or ten plants. In this form the lip is replaced by a somewhat lozenge-shaped petal, rather smaller than the typical lip, and of a rose colour, of exactly the same tint as the sepals. This gives the flower a most unusual aspect. All the flowers on each spike are of the same form. I cannot find any previous reference to a peloric form of *Ophrys apifera*, though Dr. Masters in 'Vegetable Teratology,' p. 238, mentions "Irregular Peloria" as having been observed in *Ophrys aranifera*. I am inclined to think the form is transmitted by seed, as from enquiries I have made I believe it has been known in this locality for some years. With it grows very luxuriant typical *Ophrys apifera*, also a form in which the lip—of the typical form—is unicolorous brown instead of being variegated with yellow. This I have not myself seen elsewhere.—J. H. A. Jenner.

Elymus arenarius in South Wilts. — I have this summer found a large patch (some five or six yards square) of *Elymus arenarius* on the edge of the sandy cliff between Bournemouth and Boscombe. This is, I believe, the only spot on the south coast where it is known to grow. In 'Flora Devoniensis' it is reported on the authority of "Miss Filmore" from "Exmouth Sands"; but I searched for it there in vain in 1877. So, in the 'Flora of Dorsetshire,' Mr. Mansel-Pleydell speaks of it as formerly found in that county by Dr. Pulteney, but whether at Weymouth or in Portland Pulteney was uncertain, and he has to add, "not confirmed since Pulteney's time." In 'Topographical Botany' Essex and Carnarvon are given as the most southern counties in Britain certainly known for it. It has also been reported from North Somerset, but I do not know on what authority.—W. Moyle Rogers.

Polypodium calcareum Sm. in Northamptonshire. — I found this fern growing near Roade, on a limestone cutting on the London and North-western Railway last May. It had not been recorded for the county previously, and the question naturally arises whether it is a native or a recent introduction. The fact that it is native in Bucks seems to give it some title to being considered so here, though the nature of the habitat is against it; there is, however, a good deal of surface limestone in the immediate vicinity, which may have been the original locality.—H. N. Dixon.

LYCOPODIUM CLAVATUM L. IN NORTHAMPTONSHIRE. — It may be worth while to record the finding of this plant on Harleston Heath, Northamptonshire, as it is the first time it has been found in the county. The altitude of the spot is not more than 300 ft.—H. N. DIXON.

HABENARIA ALBIDA IN BRECON.—I have to record the occurrence of this plant in the county of Brecon. Several fine specimens were gathered by the Rev. O. M. Ridley near Abergwessin, in June of this year. *H. viridis* has occurred on Bishopstone Common near Hereford. It is only recorded in Top. Bot. for the county on the authority of "Wilmott."—H. N. BIDLEY.

RATE OF INCREASE OF FAIRY RINGS. — I do not know whether any one has ever made observations upon the rate at which "Fairy Rings" increase. The following observation, however, may be of interest:—On the 21st of July, 1877, I measured two rings in a meadow near this house, burying a brick in the centre of each to mark them. To-day (August 17th, 1886) I have measured them again. In the nine years' interval one has increased from 10½ ft. in diameter to 19 ft., or about 11 in. per year; the other has increased from 20½ ft. in diameter to 31 ft., or about 14 in. per year. These measurements are taken from the outside of the rings in each case. I am unable to say what species of fungus causes the rings in question, as I never observed any growing upon them, but I should presume the species to be *Marasmius oreades*.—MILLER CHRISTY.

NOTICES OF BOOKS.

Catalogue of the Palæozoic Plants in the Department of Geology and Palæontology, British Museum (Natural History). By ROBERT KIDSTON, F.G.S. London, 1886.

THE Trustees and Mr. Kidston are alike to be congratulated on the completion of an extensive and valuable piece of work, which has occupied the author for nearly three years. Of the magnitude of the work some idea may be formed from the fact that, while 89 genera and 323 species and varieties of Palæozoic plants are retained, 77 generic and 611 specific names are sunk as synonyms, and the "List of Works quoted" contains 186 distinct entries. The geologist will part with regret from such familiar names as *Cyclopteris*, *Sagenaria*, and *Ulodendron*, though perhaps more readily from *Dadoxylon* and *Pothocites*; though certainly the abandonment of the latter name, dating from 1841, and that of *Bornia*, which is still earlier and less misleading, in favour of *Asterocalamites*, dating only from 1862, suggests some serious reflections as to the laws—or lawlessness?—of nomenclature in Palæophytology.

Still more serious, however, become one's thoughts on examining the specific names and authorities quoted therefor. In his Introduction Mr. Kidston says that he has adopted the oldest name; but his usage, which we venture to stigmatise as vicious, may best

be illustrated by examples. On p. 4 appear *Calamites decoratus* Eichwald, sp.; *C. striatus* Cotta, sp.; and *Arthropitys bistriata* Cotta, sp. The first of these three was described by Eichwald in 1860 as *Equisetites decoratus*, and, under the name it bears here, by Schimper in 1869; it is, therefore, *C. decoratus* Schimper. The second was described by Cotta in 1832 as *Calamitea striata*, but was also named *Calamites Cottæanus* by Sternberg; if, therefore, it is a true *Calamites*, its name is *C. Cottæanus* Sternberg, and *C. striatus* "Kidston" becomes an unwarrantable synonym. In 1832 also Cotta described *Calamitea bistriata*, which was not referred to the genus *Arthropitys* till 1864 or 1865, when that genus was founded by Göppert, whose authority the name should have. This blemish affects a considerable number of the specific names, so that, in addition to three professedly new names, *Bythotrephis Scotica*, *Lepidophloios Scoticus*, and *Bythotrephis divaricata*, all of "Kidston," here first described, the following twenty-four should also apparently be quoted on the same authority:—*Voltzia Liebeana* "Genitz, sp." [*sic*]; *Calamites varians*, var. *cruciatus* "Sternberg, sp."; *Sphenophyllum cuneifolium*, var. *saxifragæfolium* "Brongniart"; *Sphenopteridium Plantianum* "Carruthers, sp."; *Rhacopteris flabellata* "Tate, sp."; *Calymmatotheca affinis* and *C. bifida* "Lindley & Hutton, sp."; *Pecopteris Haidingeri* "Ettingshausen, sp."; *Alethopteris Sternbergii* "Ettingshausen, sp."; *Sigillaria Taylori* "Carruthers, sp."; *S. aquensis* "König, sp."; *Cordaites obovatus* "Carruthers, sp."; *Cardiocarpus subacutus* "Grand'Eury, sp."; *C. Lindleyi* "Carruthers"; *C. anomalus* "Morris, sp."; *Rhabdocarpus Künssbergii* "Gutbier, sp."; *Palæoxyris helicteroides* "Morris, sp."; *Asterocalamites scrobiculatus* "Schlotheim, sp."; *Calamocladus acicularis* "Dawson, sp."; *Sphenopteris curtiloba* "Dawson, sp."; *Palæopteris Rogersi*, *P. Gaspiensis*, *P. Brownii*, and *Araucarioxylon Ouangondianum*, attributed to the same authority, and *Palæopteris obtusa* "Lesquereux, sp."

Rhacopteris Geikiei is the author's new name for his own *Sphenopteris Geikiei*, and *Sphenopteris Permica* and *Bythotrephis mutabilis* are two MS. names, which the author, following an undesirable practice, accepts from Baron von Ettingshausen. It is perhaps a pity that such names as *Permica* and *Scotica* should be printed with initial capitals; but the most heinous offences against generally-accepted laws are the names assigned to the five following species:—*Dactylotheca plumosa* "Artis, sp."; *Rhacophyllum crispum* "Gutbier, sp."; *Sigillaria discophora* "König, sp."; *Lepidostrobus anthemis* "König, sp."; and *Annularia latifolia* "Dawson, sp." Of these the first was named, in 1825, by Artis, in his 'Antediluvian Phytology,' *Filicites plumosus*, but in 1883 was referred by Zeiller to his new genus *Dactylotheca*, with the specific name *dentata*. Now Zeiller was not bound to adopt the name *plumosus* or *plumosa*; but Mr. Kidston was so bound to respect the earlier name in the received genus, leaving the species *D. dentata* Zeiller. Similarly *Fucoides crispus* of Gutbier (1835) becoming *Rhacophyllum lactuca* of Schimper (1869) should have been left so; *Sigillaria discophora* "König, sp." should be *S. Preuiana* Römer

(1862); *Lepidostrobus anthemis* "König, sp." should be *L. radians* Schimper; and *Annularia latifolia* "Dawson, sp." should be *A. Dawsoni* Schimper. Perhaps the worst possible form of name is *Stachannularia* (*Bruckmannia*) *tuberculata* Sternb. sp. (p. 56), for *S. tuberculata* Weiss (1876); and surely *Psilophyton* must be neuter, so that *P. Decheniannm* Carruthers (1873) must be preferable to *P. Dechenianus* "Göppert, sp." The classification employed is only liable to slight exception in the placing of *Rhizocarpeæ* between *Equisetaceæ* and *Filicaceæ*, for the subordination of *Lycopodiaceæ* to the latter class on p. 231 is obviously only one of the limited number of typographical errors which there are in the work.

It may be interesting to the too numerous class of botanists who neglect fossil forms to note here the tribes under which Palæozoic Ferns are grouped. They are six: *Sphenopterideæ*, *Palæopterideæ*, *Neuropterideæ*, *Odontopterideæ*, *Pecopterideæ*, and *Alethopterideæ*.

It is in some respects to be regretted that stratigraphically the Catalogue should begin with the highest—Permian—beds, and also that Mr. Kidston has not seen his way to adding dates to all the references in the text, which would much simplify the study of the synonymy; but it must not be imagined from our long series of indictments that we are oblivious of the very great general value of the work. The critical discussion of such points as the bark of *Calamites*, *Neuropteris heterophylla*, *Ulodendron*, *Trigonocarpus*, and *Psilophyton* seems to be as judicious as it is interesting. Is it too much to hope that we may some day have a concise Palæozoic Descriptive Flora on the lines of this Catalogue?

G. S. Boulger.

Messrs. Swan Sonnenschein & Co. were not well advised when they bound three of their little Penny Collector's Handy-books into a shilling volume, the bulk of which is swelled by a catalogue occupying one-fourth of the book. The first little book—on Fungi, by Mr. E. M. Holmes—has some very bad and a few good figures, and the letterpress will hardly add to the author's credit. We have no evidence that "parasitic species are most abundant as a rule on plants of weak vitality;" and although we demur to the suggestion that leaf-fungi should be "placed alphabetically in drawers," such an arrangement would be at least as useful as the antiquated classification given. Mr. Peter Gray has written the account of the Lichens, which forms the second book; this contains a great deal of varied information, but the bibliography is extremely unsatisfactory. The third book, "Mosses, Scale-mosses, and Liverworts,' is also by Mr. Gray: but this is for the most part rendered unnecessary by Mr. Bagnall's excellent little book, already noticed in these pages, issued by the same firm.

New Books. — F. Woenig, 'Die Pflanzen im alten Ægypten' (Leipzig, Friedrich: 8vo, pp. 246, 174 cuts).—H. Franks, 'Flora der näheren Umgebung der Stadt Dortmund' (Dortmund: 8vo, pp. ix. 149).—M. Colmeiro, 'Enumeracion y revision de las plantas

de la peninsula Hispano-Lusitana é islas Baleares' (Tom. ii., *Calicifloras*), 8vo, pp. 642 (Madrid). — J. D. Hooker, 'Flora of British India,' part xiii., (*Chenopodiaceæ—Balanophoreæ*). — R. Blottière, 'Etude anatomique de la famille des Menispermées' (Paris, Goupy: 8vo, pp. 69, tt. 2).—D. McAlpine, 'Life-Histories of Plants' (Sonnenschein: 8vo, pp. 295: 109 figs.).

Articles in Journals.

Bot. Centralblatt (Nos. 35, 36). — V. Schiffner, 'Observationes de exoticus quibusdam Hepaticis' (*Lejeunea repanda*, *L. perforata*, *Phragmicoma Haenkeana*, *P. sphærophora*, *Riella Battandieri* Trabut, spp. nn.; 1 plate). — (No. 36). A. Nathorst, 'Uber das frühere Vorkommen der *Trapa natans*.'

Bot. Zeitung (July 23).— W. Wahrlich, 'Beitrag zur Kenntniss der Orchideenwurzelpilze.' — (July 30). W. Detmer, 'Ueber zerstörung der Molekularstructur des Protoplasma der Pflanzenzellen.'—(Aug. 6, 13, 20, 27). F. Hegelmaier, 'Zur Entwickelungsgeschichte endospermatischer Gewebekörper.'

Bull. Torrey Bot. Club (Aug.). — G. Davenport, 'Fern Notes' (*Notholæna Pringlei*, n. sp. (1 plate). — W. Trelease, 'Nectary of *Yucca*.'—E. L. Greene, 'Californian *Polypetalæ* (*Streptanthus niger*, *S. peramoenus*, spp. nn.).—T. Morong, *Potamogeton Curtisii*, sp. n.

Flora (July 21). — W. Nylander, 'Lichenes nonnulli Australienses.'—E. Röll, 'Zur Systematik der Torfmoose.' — (Aug. 1, 11). A. Geheeb, 'Bryologische Fragmente.' — (Aug. 21). E. Zimmermann, 'Beitrag zur Kenntniss der Anatomie der *Helosis guayanensis*.'

Gardeners' Chronicle (July 31). — J. D. Hooker, '*Pinus monophylla*' (fig. 24).—W. G. Smith, '*Peronospora arborescens*' (fig. 25). —'*Taxodium distichum*' (fig. 28).—(Aug. 7). R. A. Rolfe, 'Revision of *Phalænopsis*.'—(Aug. 14). *Dendrobium pogoniates* Rchb. f., sp. n. —(Aug. 21). *Anthurium subulatum* N. E. Br., and *A. Mooreanum* N. E. Br., spp. nn. — W. G. Smith, *Helminthosporium echinulatum* (fig. 50). — (Aug. 28). *Bulbophyllum saurocephalum* Rchb. f., *Epidendrum pristes* Rchb. f., *Coelogyne Foerstermanni* Rchb. f., spp. nn.; *Lælia Batemanniana*, n. hyb. (*Sophronittis grandiflora* × *Cattleya intermedia*). — P. Sewell, 'Roots and their Work.' — *Selenipedium caudatum* (fig. 54).

Journ. R. Microscopical Soc. (Aug.).—G. Massee, 'Structure and Evolution of *Florideæ*' (1 plate).

Notarisia (July). — G. B. De Toni & D. Levi, 'Primi materiali per il Censimento delle Diatomacee Italiene.'

Oesterr. Bot. Zeitschrift (August). — L. Celakovsky, *Utricularia brevicornis*, sp. n. — K. Fritsch, 'Die Rubi Neuseelands' (*R. squarrosus*, sp. n.).—C. Schilbersgky, 'Zur Teratologie der Gageabluthen' (1 plate). — J. Velenovsky, 'Flora von Ost-Rumelien.' — M. Kronfeld, 'Uber Volksthümliche Pflanzennamen.' — E. Formánek, 'Flora der Karpathen' (contd.).

Proc. Linn. Soc. N. S. Wales (May 25).—E. Haviland, '*Oidium monilioides*.'

NEW *VACCINIACEÆ* FROM NEW GUINEA.

By Baron F. von Mueller, K.C.M.G., M.D., F.R.S., &c.

CATANTHERA, nov. gen.—Calyx almost bell-shaped, at the margin entire. Petals four, quite disconnected, nearly lanceolate, gradually narrowed upwards, rounded towards the somewhat truncated base, quite membranous, imbricated and slightly twisted before expansion, never much reflected, tardily dropping. Stamens eight, all exceeded in length by the petals, those opposite to the latter much shorter than the four others; filaments compressed, not closely approaching each other; those of the longer stamens provided with a membranous sagittate-hastate terminal appendage; anthers two-celled, all introrsely and permanently turned downward, undivided, opening by a terminal but through resupination basal pore; the four longer anthers linear-cylindrical, almost stipitate towards the point of insertion at the junction of the appendage and filament, gradually narrowed upwards; the four shorter stamens only minutely appendiculate, their anthers abbreviated, almost oblong. Pollen grains smooth, free or easily separating. Style filiform. Stigma convex, not broader than the summit of the style. Ovary deeply inclosed, adnate to the basal portion of the calyx, four-celled; ovaries very numerous on large axillary placentas. An epiphyte, almost glabrous; leaves scattered, thinly coriaceous, roundish-ovate or orbicular, strongly five-nerved from near the base; peduncles from the leafless branches of the preceding year bearing simple or sometimes compound umbels; petals bright red, forming a pointed cone before expansion, often united when falling away.

Catanthera lysipetala, sp. unica. — At Sogere, near the southern base of the Owen Stanley Range; H. O. Forbes (419, 451). Branches robust. Petioles slender, ½–1 in. long. Leaves quite entire, 1½–3 in. long, 1–2 in. broad; the longitudinal nerves on each side approaching the margin, the lowest two the shortest. Peduncles about one inch long. Umbels with few or several flowers. Pedicels thin, ⅔–1 in. long, somewhat red, minutely and imperfectly bracteate and bracteolate at the base. Flowering calyces about ¼ in. long, not angular, membranous at their expanding limb. Petals ⅓–½ in. long, overlapping also at the base, quite free from each other. Anthers never turning upwards, closely repressed, all longer than their filaments; the four larger about 1–5th in. long, the others only of half that length, but more turgid; opening of all the anthers through their resupination apparently basal, but really terminal, the cells of the shorter anthers slightly pointed at the upturned base; the stipes of the longer anthers to be considered an infracted prolongation of the filament. Pollen grains of the longer anthers smaller, more scanty and more globular; pollen grains of the shorter anthers larger, more copious and more ellipsoid. Style ⅔–1 in. long, straight, but at last curved ascendingly, slightly thicker towards and above the middle. Disk from the base of the

calyx-limb descending to the summit of the ovary, minutely crenulated at the edge, finely and distantly nerved downward. Summit of ovary convex. Fruit as yet unknown.

The combined characteristic of petals perfectly separated and of anthers continuously completely bent downward, demand for this vacciniaceous plant a distinct generic position; the first of these two marks of distinction brings the genus near *Oxycoccos*, more particularly so as the latter produces likewise only four petals, which, moreover, are not unlike in form to those of our plant; the second characteristic, that of anthers inwardly resupinate, seems quite exceptional in the tribes of *Ericeæ* and *Vaccinieæ*, though the anthers of *Clethreæ* and *Pyrolaceæ* are extrorsely retroflected prior to the expansion of the flowers, the introflection taking place during anthesis; nevertheless, the unique characteristic of stationary introrse refraction of the anthers separates this now established genus from all others of the order, and brings the above-mentioned tribal groups in a new and unexpected connection, while this new Papuan plant shows by the two very distinct forms of anthers within the same flower an approach to the likewise solely Papuan *Dimorphanthera*.

Agapetes (*Dimorphanthera*) **Forbesii**, n. sp. Epiphyte, at Sogere, near the base of the Owen Stanley Range; H. O. Forbes, (296). — Branchlets robust, somewhat angular. Leaves short-stalked, scattered, ovate- or broad-lanceolate, short-acuminate, thinly coriaceous, slightly denticulated, 6 to 7 in. long and 2½ to 3 in. broad, flat, with two pairs beneath prominent longitudinal nerves, one pair starting from near the base of the leaf, the other from somewhat further upwards, at each side of the leaves close to their base a depressed gland. Flowers few or two or rarely one from the axils of petioles, becoming by the lapse of the leaves lateral. Pedicels rather thick, slightly downy, ¼–½ in. long, clasped by unilaterally much connate broad but short bracteoles at the base. Calyces short-downy, brownish, nearly semi-globular, but constricted close to the truncated base, at flowering time ¼–⅓ in. broad, minutely denticulated. Corolla dull-coloured in a dry state, fully an inch long, if not longer, of rather thick texture, minutely downy outside, glabrous inside, furrowed downward to near the middle, its lobes five, narrowly semilanceolate, several times shorter than the tube, inflexed-valvate before expansion, also finally not much spreading. Stamens ten, alternately longer and shorter, inserted on the epigynous disk along with the corolla, the larger five nearly half as long as the latter. Filaments flat, membranous, almost glabrous, closely approaching each other, but really disconnected. Anthers slightly hairy, the five larger obverse-sagittate, of greater length than that of their filaments, which are often bidentate at the apex, dorsifixed, minutely bidenticulated at the base, the connective produced into a narrow semi-lanceolate bifid hairy appendage considerably beyond the anther-cells, the latter opening by a pore-like slit towards the summit and placed contiguously to the cells of the next large anther; the five smaller anthers also bilocular, but almost linear, bifid at the summit, each cell opening by a separate

short slit, the connective continuous with the filament, subulate-semilanceolar, not surpassing the anther-cells, the filaments only half as broad as those of the larger stamens. Style nearly 1½ in. long, filiform, glabrous, finally deciduous. Stigma not broader than the style, convex, undivided, though somewhat furrowed. Epigynous disk glabrous, crenulated and undulated outwards. Fruit-calyx about ½ in. broad, but not quite as long, pale brown, smooth, on an upward thickened pedicel, persistent, from above the middle much attenuated, thence upwards annular-cylindrical, at the summit bent inward; fruit connate with the calyx except at the broad, slightly convex summit, quite enclosed, depressed globular, neither dehiscent nor succulent, 5-celled. Placentas axillary, stipitate, renate. Seeds very numerous, about 1-16th in. long. crowded all over the placentas, closely filling the cavities, twice or thrice longer than broad, somewhat angular, from the convex summit gradually narrowed downward; testa pale brownish, reticulated, shining.

From the only allied species hitherto known, namely, *A. meliphagidum* Beccari (Malesia i. 209), the present one is separated by shorter petioles, connate bracteoles, not conspicuously five-dentate calyces, acute lobes of the corolla, the not obtuse connective of the anthers; the fruit of the two may also prove different.

A. Moorhousiana (F. v. Muell. in Wing's S. Science Record, new ser. ii. Feb., 1886) occurs also in Mr. Forbes's collection (764).—The leaves attain a length of five inches and a breadth of two. The fascicles of flowers are not provided with peduncles, and emerge either solitary from the axils of leaf-stalks, or are crowded below the leaves along the branches. The fruit remains unknown.

[In a letter accompanying the above descriptions, Baron von Mueller has asked me to compare them with the larger series of Mr. Forbes's specimens received at the British Museum, and to add any additional characters which these might supply. I find scarcely anything to supplement his description, but with regard to *Agapetes Forbesii* it may be noted that in our specimens the peduncles are contracted, 5-6th in. long or obsolete, solitary or two together, and the bracts rotundate, solitary, not deciduous, at the base of the lower pedicels, alternate with the connate bracteoles, or two at the base of the two topmost pedicels, alternate. Mr. Forbes's no. 768 (from Mount Wori-wori, 5000 ft.) also belongs to this species.—W. Fawcett.]

NOTES ON THE ORCHIDS OF TROPICAL AFRICA.

By H. N. Ridley, M.A., F.L.S.

When one compares the Orchids at present known from Tropical Africa with those of any other tropical region of equal extent, it is impossible to avoid being struck by the comparative paucity of species to be found in it. Not much more than thirty

genera are represented, and of these only five are endemic. The great deficiency lies in the epiphytic species. This is to be explained in part by the limited amount of forest-country, at least in the best explored parts. The grass plains which form so large a portion of the centre of the continent are so subject to fire that only plants which can survive this accident can thrive there. The whole of the tropical portion of the continent may be divided into three regions, the Western Forest or Guinea Region, the Abyssinian, and the Central Region. The first of these contains the bulk of the epiphytic species. It has, however, been very little explored, and will doubtless yield many more when further investigations have been made in it. The characteristic genera are *Bulbophyllum*, *Megaclinium*, *Angræcum*, *Manniella*, *Corymbis*. It contains a considerable number of genera of East Indian affinities, only represented here by one or two species, such as *Phius*, *Calanthe*, *Zeuxine*, *Cheirostylis*, *Pogonia* (*Nervilia* section), and *Epipogon*. Traces of connection with the American continent would hardly be expected in a group supposed to be of so recent an origin as the Orchids, but no less than three species occur in both continents, viz., *Liparis elata* (the Sierra Leone variety being only distinguished by its reddish colour) *Eceoclades maculata*, and *Cyrtopera Woodfordii*.

The Abyssinian Region is very deficient in epiphytes, a few Polystachyas and Angræcums being the only known species. *Bulbophyllum*, *Megaclinium*, and *Vanilla* are entirely absent. The *Neottieæ*, too, are not represented. It is very rich, however, in *Ophrydeæ*, especially Habenarias, Satyriums and Holothrix. It contains two endemic genera, *Pteroglossaspis* and *Rœperocharis*. The affinities of the Orchid flora may be considered as with Southern Extra-tropical Africa. The Central Region is equally poor in epiphytes, but is rich in such plants as can defy the ravages of the grass fires, such as *Eulophia*, *Lissochilus* and *Habenaria*. *Epidendreæ* and *Neottieæ* both appear to be almost entirely unrepresented. In the Eastern Coast occur a few plants having affinities with the Madagascar Archipelago, such as *Angræcum eburneum* and species of *Acampe* and *Gussonea*.

Megaclinium.—The fruit of no species of this genus appears to have been described. A fruiting specimen of *M. maximum* Lindl., a native of Sierra Leone, collected by Smeathman, is to be found in the Herbarium of the British Museum. The capsules are sessile, oblong in outline, with low waved ribs, all equal. They are half an inch long and a quarter of an inch in diameter, and are crowned by the relics of the perianth.

Gussonea exilis Ridl., only hitherto known from Madagascar, was obtained by the Rev. W. E. Taylor, at Jomvu, in Nyika-land. It is called "Ndiko" by the natives, who by boiling extract from the roots, which are very numerous, a grey dye used for ornamenting arrows.

Eulophia gracillima, n. sp.—Planta gracillima. Caulis basi bulbosus, foliis vaginantibus tectus. Folia striata gracilia linearia acuta 6–8 uncias longa. Scapus erectus pedalis gracillimus. Racemus biuncialis laxus. Flores parvi circiter 15, $\frac{1}{4}$ uncia longi.

Bracteæ lanceolatæ acuminatæ pedicillis gracillimis subæquales. Sepala et petala subsimilia lanceolata obtusa æqualia. Labellum trilobum marginibus crenulatis, laciniæ laterales obtusæ breves; media ovata seriebus tribus papillarum versus apices incrassatarum. Calcar breve rectum apice clavato. Columna rectiuscula brevis. Anthera obtusa haud apiculata.

Old Calabar, Dr. Robb.

This plant is very remarkable for its very slender habit, small size, and narrow linear leaves.

Lissochilus Taylorii, n. sp.—Pseudobulbus oblongus, conicus $2\frac{1}{2}$ uncias longus. Folia anguste linearia, 6 in fasciculo. Ultra pedalia $\frac{3}{4}$ uncia lata. Scapus validulus tripedalis basi vaginis pallidus tectus. Vaginæ dissitæ in scapo 3 laxæ, $2\frac{1}{2}$ uncia longæ. Bracteæ lanceolatæ acuminatæ $\frac{1}{2}$ uncia longæ. Pedicelli $\frac{3}{4}$ uncia longi. Flores carnosæ mediocres. Sepala ovata lanceolata acuminata $\frac{5}{16}$ uncias longa. Petala ovata obtusa 6 nervia, $\frac{5}{8}$ uncia longa $\frac{3}{8}$ lata. Labellum trilobum, laciniæ laterales breves rotundatæ, media $\frac{1}{2}$ uncia longa, oblonga elliptica obtusa crispula, carinis sinuatis parum elevatis 8. Calcar brevissimum conicum. Columna crassa. Anthera conica obtusa apice fuscata.

Jomvu, Rabai Hills, Rev. W. E. Taylor, Jan. 1886.

L. Wakefieldii S. Moore & Rchb. f.—Grassy meadows near Jomvu and Rabai, flowering in September, and at Rabai, on the way to Wandara, in January, 1886, Rev. W. E. Taylor.

Habenaria eburnea, n. sp.—Tubera 3-uncialia lanata. Folia radicalia bina orbiculata rotundata patentia obtusa, 3 uncias longa et lata. Scapus sesquipedalis. Bracteæ membranaceæ 3–4 dissitæ lanceolatæ longe acuminatæ venosæ, ferme unciales. Flores plures majusculæ albi, pedicellis $\frac{1}{2}$ uncialibus. Sepalum posticum galeatum lanceolatum cucullatum acuminatum; lateralia reflexa obcuneata acuminata obliqua semiuncialia 5-nervia. Petala angusta linearia erecta simplicia. Labellum trilobum basi angusto, laciniis angustissime linearibus acutis acuminatis circiter uncialibus. Calcar triunciale filiforme acutum versus apicem attenuatum. Anthera acuminata brachiis porrectis grandiusculis. Pollinia aurantiaca pedicellis longis. Ovarium $1\frac{1}{2}$ uncia longum.

Very rare; among bushes only; two specimens seen. Flowers pure white. Mandra, August, 1854: E. Vogel.

H. ceratopetala Richard, Ann. sc. nat. ser. ii., xiv. 267, t. xvi. Tent. Fl. Abyss. ii. 295.—"By the cataract of the River Repp, at an elevation of from 7000 to 8000 feet. Gerra Abuna, Tekla, two hours east of Gaffat. The flowers have an odour of vanilla, and might be used as such." Abyssinia, Schimper "1863–8," no. 1176.

H. leptobrachiata, n. sp.—Tubera bina oblonga. Folia radicalia ovata lanceolata recurva, superne in bracteis vaginantibus laxis attenuata. Caulis 7 uncialis ad pedalis. Racemus densus multiflorus. Bracteæ virides ovaria superantes, lanceolatæ $\frac{3}{4}$ uncia longæ, $\frac{1}{8}$ uncia latæ. Flores parvuli. Sepalum posticum galeatum lanceolatum apiculatum apice recurvum parvulum, marginibus ciliatis; lateralia lanceolata oblonga obliqua apiculata reflexa,

$\frac{3}{8}$ uncia longa. Petala bifida, marginibus ciliatis, lacinia postica brevis suberecta angusta linearis lorata, antica lanceolata linearis, attenuata ferme $\frac{1}{2}$ uncia longa reflexa. Labellum deflexum trilobum, lobi angustissimi filiformes, lacinia media longior et latior. Calcar ovario subæquale pendulum clavatum basi gracile. Anthera brevis, galea (flore aperto) haud tecta, brachia tenuissima abrupte recurva, ferme parallela cum loculis. Stigmata brevia truncata crassiuscula, apicibus incrassatis quam antheræ breviores subporrecta vel paullo recurva. Ovarium cum pedicello $\frac{1}{2}$ unciale.

Abyssinia, Dschau Meda, at the foot of the mountains, at 8500 ft., on the edges of bushes, Sept. 5, 1863. Schimper, "1863–8," no. 1324.

H. combusta, n. sp.—Tubera bina ovalia rotundata, demum oblonga. Planta 6–8 uncias alta, validula. Folia dissita inferiora lanceolata acuta vaginantia mucronulata 2 uncias longa, $\frac{1}{2}$–$\frac{3}{4}$ lata, superiora in bractes attenuata. Racemus densus comosus multiflorus $1\frac{1}{2}$ uncias longus. Flores iis *H. viridis* æquales. Bracteæ lanceolatæ acuminatæ superiores, obscuræ, ovariis longiores $\frac{1}{2}$ unciales. Sepala et petala omnia erecta, sepala ovalia lanceolata mucronata, apicibus atratis. Petala tenuiora, oblonga elliptica obtusa paullo obliqua quam sepala breviora et latiora. Labellum trilobum breve, basi dilatato, lobis ligulatis obtusis carnosulis lateralibus excurvis, medio recto, longiore. Calcar brevissimum saccatum obtusum. Antheræ loculi basi divergentes brachia subnulla. Lobus stigmaticus ellipticus oblongus integer.

Abyssinia. Mount Gunna, 10,000 ft. above sea. Schimper, no. 1312.

This seems to be near *H. peristyloides* Richard Tent, Fl. Abyss. ii. p. 291, but differs in the dense raceme, comose bracts, very short spur, hardly equalling the broad but short base of lip, and single stigmatic lobe. The tips of the sepals and bracts are dark-coloured in the dry plant, so that the apex of the raceme is darker than the rest, as in our *Orchis ustulata*. The stigmatic lobe occupies the centre of the flower, and is so placed as to cover the entrance to the spur.

H. variabilis, n. sp.—Planta sæpius alta $1\frac{1}{2}$–2 pedalia. Tubera bina ovalia, radices elongati etiam plures. Caulis validulus, undique foliatus. Folia raro subcongesta lanceolata subacuta (majora) circiter 5 uncialis $1\frac{1}{2}$ uncias lata, aliquando cauli arcte appressa, raro subcongesta, subpatula acuta. Racemus densus haud raro subsecundus, multiflorus elongatus. Bracteæ lanceolatæ acuminatæ ovaria superantes. Flores parvi. Sepalum posticum erectum lanceolatum obtusum, lateralia deflexa, omnia sæpius ciliata. Petala latiora obtusiora erecta cum sepalo postico conniventia. Labellum breviusculum cuneatum trilobum, lobis lateralibus falcatis, medio latiore et longiore, carnosulis minute papillosis. Calcar $\frac{1}{2}$ unciale filiforme, antheræ loculi recti, brachia brevissima. Lobi stigmatici bini carnosi, ligulati vel sub-bilobi, ciliati.

Apparently common and very variable in Abyssinia. The most distinct forms are—

β. *parviflora*.—Flores minores, in racemo laxiore. Caulis altus, foliis arcte appressis vaginantibus tectus. Schimper, no. 1292. Dschau Meda meadows, at 8500 feet altitude.

c. *acutifolia*.—Folia subcongesta plicata acuminata subpatula, racemo denso.

Schimper, no. 1304. Mount Gunna, 10,000 ft. above sea, Sept. 12, 1863 (in part).

The more typical plants were obtained with the preceding on Mount Gunna, No. 1333, and at Dewra Tabor, on the mountains, among bushes in meadows at 8500 ft. above sea-level. No. 1265.

I can find no tangible and reliable differences between these forms, although at first sight several appear very distinct. The short lip, distinct fleshy stigmatic lobes, and long slender spur, and bracts longer than ovary, seem good points in which all agree.

H. Wilfordii, n. sp.—Planta gracilis 9 uncialis. Folia lanceolata acuminata remota uncialia circiter 4. Bracteæ cucullatæ lanceolatæ acuminatæ. Flores bini in apicem caulis, pedicellis brevibus, iis *H. croceæ* paullo majores. Sepalum posticum erectum lanceolatum subacutum, lateralia deflexa lanceolata obtusa. Petala erecta lanceolata falcata obtusa. Labellum ligulatum recurvum $\frac{1}{4}$ unciale. Calcar filiforme subclavatum pendulum quam ovarium brevius. Ovarium $\frac{1}{2}$ unciale. Anthera brevis, brachia gracilia porrecta, vel paullulo recurva. Stigmata brevia crassa subtriangularia truncata, quam antheræ brachia breviora.

Sierra Leone, Wilford.

This plant is allied to and resembles closely *H. crocea* Schweinfurth, but the flowers are larger, with lanceolate subacute sepals, and different shaped stigmatic lobes.

H. Vogelii, n. sp. (Cultratæ).—Tuber 2, majuscula globulosa pedicellata, radices elongatæ vix lanatæ. Planta strictim erecta bipedalis. Folia angusta lanceolata, stricta acuminata 6–7 uncialia, $\frac{1}{2}$ uncias lata, remota. Racemus laxus; flores plures albescentes pedicellati. Bracteæ lanceolatæ acutæ vix $\frac{1}{2}$ unciales, pedicelli $\frac{5}{6}$ unciales. Sepalum posticum erectum breve lanceolatum cucullatum: lateralia reflexa ovario æqualia obcuneata obliqua obtusa, apice uncatula. Petala bifida, laciniæ breves lineares lanceolatæ acuminatæ, postica quam antica paullo longior. Labellum trilobum breve vix stylo æquale, laciniæ anguste lineares obtusæ media paulo longior et latior. Calcar pendulum ovario vix longius $\frac{1}{2}$ unciale cylindricum filiforme truncatum obtusum vix clavatum. Antheræ brachia quam styli breviora, basi latiora apicibus attenuatis. Styli $\frac{3}{8}$ uncia longi graciles clavato-incrassati, truncati.

In a marshy mountain meadow by Mosa, Mandra, Aug. 1854. E. Vogel, no. 40.

H. SOCHENSIS Reichb. fil. Rabai Hills, Mombaz, Rev. W. E. Taylor.—This specimen is rather bigger than the type in Herb. Kew, and has much longer leaves.

Holothrix montigena, n. sp. — Tubera bina grandiuscula oblonga vel ovata. Folium singulum amplexicaule rotundatum circiter uncia longum et latum basi vaginatum. Scapus crassiusculus, semipedalis basi villosus, superne glaber, bracteis pluribus

lanceolatis acuminatis, ¼ uncia longis dissitis. Racemus pluriflorus subsecundus biuncialis densus. Sepalum posticum lanceolatum pustulatum; lateralia subobliqua lanceolata mucronata. Petala tenuiora majora lanceolata acuta papillosa. Labellum trilobum obcuneatum pubescens, lobis lateralibus falcatis obtusis brevibus. Calcar breve cornutum curvum acuminatum. Anthera cucullata papillosa, brachia brevia curva.

Abyssinia. Gaffat, in dry places half shaded by small bushes, at 8400 ft. above the sea. Aug. 23, 1863. Schimper, no. 1372.

Disa pulchella Richard, Tent. Fl. Abyss.

Dewra Tabor, on the mountains among bushes. Aug. 12, 1863. Schimper, no. 1316.

I believe that this is the plant intended by Richard, but I have not seen a type-specimen. He describes the flowers as purplish; in Schimper's specimens the lateral sepals and lip appear to have been of a deep blue-purple, the dorsal sepal and petals of some pale colour with purple spots. The bracts also are purple. The spur is rather thicker than it is represented in Richard's figure.

All the species described are in the British Museum Herbarium.

ON THE NOMENCLATURE OF SOME *PROTEACEÆ*.

By James Britten, F.L.S.

At p. 52 (footnote) of this Journal I promised to bring forward instances of the manner in which the priority of names published by R. A. Salisbury had been ignored by subsequent authors. This I now proceed to do, referring especially to the *Proteaceæ*, in which order the names generally accepted for many genera will have to give place to Salisbury's earlier publications. As Cape *Proteaceæ* are, I believe, now being elucidated by Mr. N. E. Brown, for the long-promised continuation of the 'Flora Capensis,' it seems desirable, in the interests of nomenclature, to call attention to these names, in the hope that they may be restored to their proper position.

In 1809 there was published a work, the title-page of which runs as follows:—"On the Cultivation of Plants belonging to the Natural Order Proteeæ, with their Generic as well as Specific characters, and places where they grow wild. By Joseph Knight, F.H.S." (4to, pp. xix, 128). Knight had been gardener to George Hibbert,* M.P., of Clapham, and had then settled in business as a

---

* "George Hibbert, Esq., M.P., F.L.S., a gentleman eminently distinguished for his love of plants and the liberality of his communications, who purchased the entire herbarium of the late Professor Murray, of Göttingen, and for some time maintained an able collector [James Niven] at the Cape of Good Hope, for the purpose of enriching his garden with living plants; as well as his herbarium, and those of his friends, with dried specimens."—Smith, in Rees's 'Cyclopædia.' The genus *Hibbertia* was named in his honour in Andrews' 'Botanist's Repository,' t. 126, the description being written (*fide* Salisbury's 'Paradisus,' t. 73), as was much of the letterpress of that work, by Lewis

nurseryman in King's Road, Chelsea, having acquired Mr. Hibbert's collections as a foundation. This was the foundation of the business subsequently carried on under the names of Knight and Perry; and now, as for many years past, by the Messrs. Veitch.

We have no evidence that Knight had the slightest claim to be considered a botanist, and there can be little doubt that the whole of the botanical portion of his work was written by Salisbury.* This, indeed, may be inferred from the preface, where it is stated that "for the names only of the different Genera, their various authors have been quoted, except those of R. A. Salisbury, Esq., whose manuscripts have been found so useful in every sheet." From internal evidence it is, I think, clear that this preface was, at any rate in great part, written by Salisbury. It is a nice point in nomenclature as to whether Salisbury or Knight should stand as the authority for the many species here first published; but it will be easy to show that the names themselves have priority over the generally accepted ones of Robert Brown.

I am of opinion that there was a tacit understanding on the part of the botanical leaders of the period, including Brown, Banks, and Smith, that Salisbury's work and names should as far as possible be ignored, not only on account of their strong antipathy to the man himself, but also, in Smith's case at least, to the views of classification which Salisbury promulgated. In the 'Banksian Correspondence' are copies of letters which passed between Smith and Salisbury, which were sent by Smith to Banks; as well as the correspondence between Smith and Banks on the subject, an abstract of which may at some time be worth publishing. The evidence of this is not, however, needed to show that Salisbury was an irritable man, with a strong and not altogether unfounded belief in his botanical attainments, and an acrimonious manner of stating his views. But this cannot justify the boycotting of his work by his contemporaries and successors, nor, even if the serious charges affecting his moral character be admitted as accurate, can they be held to excuse the wholesale ignoring of his botanical publications.

With regard to the names published in Knight's 'Proteeæ,'

Kennedy, of the firm of Lee & Kennedy, of Hammersmith. I hope to publish later some notes on the authorship of the 'Repository.' Hibbert was a London merchant; his garden at Clapham was well known; "his liberality made the collection at Clapham resemble a public botanic garden rather than that of a private individual" (Knight, 'Proteēæ,' preface, p. vi); and he "for many years possessed the most extensive collection of living Proteas that has ever been formed" (R. Brown in Trans. Linn. Soc. x. 46). He was elected F.L.S., July 16th, 1793. In *Hibbertia*, as in so many other cases, one of Salisbury's names has been ignored; his *H. angustifolia* (Parad. Lond., under t. 73) antedates *H. procumbens* of DC. Syst. i. 427, of which, in the latter work and in 'Flora Australiensis' (i. 33), it is treated as a synonym. Baron Ferd. von Mueller, however (Census Austral. Plants, 2), restores it to its place as the correct name of the species.

* This is, however, denied by Johnson (Hist. Gardening (1829), p. 282), who says:—"This work has been attributed to Mr. Salisbury, but it is the production of Mr. Knight, gardener to — Hibbert, Esq., of Clapton [Clapham], whose collection of plants he now possesses, and carries on the business of a nurseryman."

the position seems to be as follows. Robert Brown read a paper before the Linnean Society, on Jan. 17th, 1809, "On the Proteaceæ of Jussieu," which was not published until 1811. Meanwhile, during 1809, Knight's book was issued, containing descriptions of many of the plants taken up by Brown in his paper, in the preface to which we read:—"Perhaps few works have greater claims to originality than the present, not a single line being copied from any other." There is no reference in the book to Brown's paper, at the reading of which Salisbury was present;* it may be that the sentence just quoted was written as a defence against the charge which he had good reason to expect. At any rate, the charge was soon made. "How shocked was I," writes Goodenough to Smith, Dec. 26th, 1809, "to see Salisbury's surreptitious anticipation of Brown's paper on the New Holland plants, under the name and disguise of Mr. Hibbert's gardener! Oh, it is too bad! I think Salisbury is got just where Catiline was when Cicero attacked him, *viz.*, to that point of shameful doing when no good man could be found to defend him. I would not speak to him at the anniversary of the Royal Society."† Brown speaks of the book as "nimis festinanter conscriptus."‡

Although Brown's Linnean paper was not published till 1810, it probably antedates the 'Prodromus,' as Brown quotes the pages of it throughout the *Proteaceæ* of that work; he also cites the names from Knight's book, under the abbreviation, "Knight et Salisb. prot." It is clear that the Linnean paper was not issued before Knight's book, for Brown, speaking of some error into which Salisbury had fallen, writes, "Error procul dubio ortus e nostrâ dissertatione (in Linn. Trans., *l. c.*) malè intellectâ, vel memoriâ imperfecta retentâ a D. Salisbury, qui ejusdem coram Societate Linnæanâ lectionem audivit" (Prodr. p. 376). Had the paper in printed form been accessible to Salisbury, Brown would not thus have explained his mistake. Again, in Knight's book (p. 110), we find the name "*Josephia*, R. Br.," followed by the remark,—"A genus, most happily selected by Mr. Robert Brown, to bear the Christian name of his great Patron." This is at first sight somewhat puzzling, as no such name appears in the descriptive portion of Brown's paper; although it is mentioned incidentally in the introductory essay (pp. 22, 31). Salisbury, having only heard the paper read, naturally attributes the name to Brown, being of course ignorant of its supersession by *Dryandra* in the paper as printed. His remark on its dedication seems to imply that Brown wished to flatter Banks, and was clearly taken by Brown himself in that sense, and resented by him. In the 'Prodromus' (p. 397) he writes:—"Cum dissertatio citata de Proteaceis coram Societate Linneanâ lecta fuit huic generi Josephiæ nomen imposui; solum modò ob ejusdem arctem affinitatem cum Banksiâ, et minimè e vano desiderio tali modo officiosè celebrandi nomen jam per totum orbem scientiæ perillustre."

---

* "Salisbury ejusdem coram Societate Linneanâ lectionem audivit."—Brown, 'Prodromus,' 376.

† 'Memoir of Sir J. E. Smith,' i. 588.

‡ 'Prodromus,' 391.

It is obvious that—even if the extreme view be urged that the reading of the paper before the Linnean Society was a publication—the name *Josephia* must supersede *Dryandra*. The specific names may remain, save in the two following cases:—

JOSEPHIA "R. Br.," ex Knight, Prot., 110 (1809).	DRYANDRA R. Br., Prodr., 396, Trans. Linn. Soc. x. (1810).
J. sessilis Knight,* *l. c.* 110.	*D. floribunda* Br., *l. c.* 212.
J. rachidifolia Knight, *l. c.* 111.	*D. nivea* Br., *l. c.* 214.

The following are the changes which must be made in the nomenclature of genera and species, if the law of priority—the only one which can stand the test of practical use—is to be observed. It is no part of my purpose to give in full the revised synonymy of all the species belonging to the genera in question; I confine myself to those enumerated both by Knight and Brown:—

TRICONDYLUS "Salisb.," Knight, Prot., 121 (1809).	LOMATIA R. Br., Trans. Linn. Soc. x. 199 (1810).
T. myricæfolius Knight, *l. c.* 122.	*L. longifolia* Br., *l. c.* 200.
T. tinctorius Knight, *l. c.* 122.	*L. tinctoria* Br., *l. c.* 199.
T. silaifolius Knight, *l. c.* 122.	*L. silaifolia* Br., *l. c.* 199.
T. ferrugineus Knight, *l. c.* 123.	*L. ferruginea* Br., *l. c.* 200.
RYMANDRA "Salisb.," Knight, Prot., 124 (1809).	KNIGHTIA R. Br., Trans. Linn. Soc. x. 193 (1810).
R. excelsa Knight.	*K. excelsa* Br., *l. c.* 194.
CYBELE "Salisb.," Knight, Prot., 123 (1809).	STENOCARPUS R. Br., Trans. Linn. Soc. x. 201 (1810).
C. umbellifera Knight, *l. c.* 124.	*S. Forsteri* Br., *l. c.*
HYLOGYNE "Salisb.," Knight, Prot., 126 (1809).	TELOPEA R. Br., Trans. Linn. Soc. x. 197 (1810).
H. speciosa Knight, *l. c.*	*T. speciosissima* Br., *l. c.* 198.
SORANTHE "Salisb.," Knight, Prot., 71 (1809).	SOROCEPHALUS R. Br., Trans. Linn. Soc. x. 139 (1810).
S. glanduligera l. c. 71.	*S. imbricatus* l. c. 142.
S. ciliciiflora l. c. 72.	*S. lanatus* l. c. 142.
S. tenuifolia l. c. 72.	*S. tenuifolia* l. c. 141.
S. clavigera l. c. 73.	*S. spatalloides* l. c. 141.

I am not able to identify the three remaining species given by Knight (*S. rupestris*, *S. pinifolia*, and *S. montana*) with those enumerated by Brown, but this will no doubt be easy to anyone who has made a study of the genus.

Salisbury's genus *Paranomus* stands on a different footing from those published in 'Proteëæ,' having been established by him in the 'Paradisus,' under t. 67, published April 1st, 1807. Brown's reasons for substituting the name *Nivenia* cannot be accepted as sufficient. Citing the name *Paranomus* as a synonym, he says:—"This genus is published by Mr. Salisbury; his primary generic

* I have cited the names as of Knight, but the example of R. Brown, who quotes them as of "Knight & Salisb.," may be preferable.

character does not at all differ from that which he has given to Mimetes. In his account of inflorescence, however, it is evident he understood the genus nearly as I have here proposed it; I should therefore have adopted his name had it appeared to me tenable; but I am disposed to believe that he will, on reconsidering the subject, see the propriety of relinquishing it; for the irregularity or unusual structure, which (if I understand him) he says exists, 'tot partibus diversis,' only takes place in the leaves of a small number of species; on the other hand, the flowers of all are perfectly regular, and that too in opposition to some of the most nearly related genera, while the great uniformity and regularity of inflorescence forms an essential part of its character" (Trans. Linn. Soc. x. 133). Bentham and Hooker follow Brown, as does Meisner in the 'Prodromus.' The synonymy of the species, so far as those published by Salisbury and Brown are concerned, stands thus:—

Paranomus Salisb., Parad. sub t. 67 (1807).	Nivenia Br., Trans. Linn. Soc. x. 133 (1810).
P. cumuliflorus Salisb., in Knight, Prot., 68 (1809).	*N. Lagopus* Br., Trans. Linn. Soc. x. 137.
P. sceptriformis Salisb., *l. c.* 69.	*N. sceptrum* Br., *l. c.* 134.
P. adiantifolius Salisb., *l. c.* 70.	*N. spathulata* Br., *l. c.* 135.

The above identifications are based on the fact that Salisbury and Brown respectively quote the same synonyms for these species. It is no part of my purpose to correlate Salisbury's remaining species of *Paranomus* with Brown's remaining Nivenias; this will have to be undertaken when the 'Flora Capensis' is written. Types of a large number of Brown's Cape *Proteaceæ* are in the National Herbarium at the British Museum.

Apart from those published in Knight's work, certain other *Proteaceæ* must resume the names which were rejected by Brown. Such are—

Hakea gibbosa Cav. Anal. Hist. Nat. i. 215 (1799) = *H. pubescens* Schrad. Sert. i. 27 (1795), which is quoted by Brown and Bentham as a synonym.

H. acicularis "Knight et Salisb." Prot. 107 (1809); R. Br. in Trans. Linn. Soc. x. 181, Prod. 383 = *H. sericea* Schrad., *l. c.*; also quoted by Brown and Bentham.

Banksia latifolia Br.* (1810) = *B. robur* Cav. Ic. vi. 29, t. 543 (1801).

B. marcescens Br.† (1810) = *B. præmorsa* Andr. Repos. t. 258 (1802).

B. æmula Br. (1810) = *B. serratifolia* Salisb. Prod. 51‡ (1796).

---

* "Nomen Cavanillesii mutare coactus fui, quoniam reverâ frutex est humilis, sæpius 3-4 pedalis, vix unquam orgyalis."—Br., Prod. 392.

† "Folia minimè præmorsa, falsum nomen mutare itaque non hesitavi."—Id. 395.

‡ Brown cites this as a doubtful synonym, but Bentham (Fl. Austr. v. 556) accepts it without any sign of doubt.

SUPPLEMENTUM ENUMERATIONI *DIANTHI.*

Auctore F. N. Williams.

Vide Journ. Bot. 1885, pp. 340—349.

[49. *Dianthus diutinus* = 57. *D. polymorphus.*]

51. *D. compactus* var. *Preluciana* mihi.—Calyx viridis. Petala pallidissima. Prope Preluci in Hungaria, 1885.

55. *D. collinus* var. *imeretica* Rupr.—Glaber. Inflorescentia florum parvorum fasciculis. In Imeretia.

117. *D. multipunctatus* var. *holosericea* mihi. Anatolia.

119a. *D. brachyanthus* Schur. — With difficulty distinguished from *D. cæsius*; but is found in the same locality with the latter, near Kronstadt in Transsylvania, and appears sufficiently distinct. Not to be confounded with Boissier's homonym.

130. *D. alpinus*, var. *Semenovii* Reg. et Herd. Enum. pl. Semenov. ii. 5.—Dense cæspitosus. Bractæ 6. Prope Alatan.

[142. *D. ruthenicus*.—On revision not satisfactorily identified: copied into various Russian floras and most probably = *D. versicolor*].

[172. *D. Levieri* = *D. liburnicus* × *D. sylvestris genuinus* Wulf.].

190a. **D. angolensis,** Hiern ms., sp. nov. — Glaber. Caules 30 centim., teretes, ramosi, tenues. Folia lanceolato-linearia, adpressa; radicalia 60–65 mm,, 5-nervia, caulinia 50–55 mm., 3-nervia; vaginis quibus longitudine latitudinem æquante. Flores racemis laxis nec sæpius subsolitarii. Bracteæ 6–8 ovatæ, ad ½ calycis longitudinem acuminatæ, adpressæ. Calyx dentibus lanceolatis acutis. Petala obovata, dentata. Prope Caconda sub. lat. 14° mer. Jul., 1880.

Differt a *D. holopetalus*, specie capensi, caulibus semper glabris teretibusque, floribus plerumque racemis laxis, bracteis interdum 8, calyce dentibus brevibus, petalis dentalis longioribus.

204. *D. leucophæus* var. *macropetalon* Clem.—Tchihatcheff, Asie Min. i. 220. Petala latiora, supra purpurea, infra pallidiora.

ON THE FLORA OF CEYLON, ESPECIALLY AS AFFECTED BY CLIMATE.*

By Henry Trimen, M.B., F.L.S.

In giving a brief account of the flora of the tropical island of Ceylon, I wish to direct attention especially to its intimate connection with the climatic peculiarities of the country. With this object I will first notice certain facts regarding the physiography of Ceylon, which are not, I think, generally known. For, to the ordinary traveller, "Ceylon" means but a portion of the island, that portion which occupies the south-west, and forms considerably

---

* Read at the Meeting of the British Association, Section D, on Sept. 4th, 1886.

less than a quarter of the whole country. It is here that are situated the ports of Colombo and of Galle, the beautifully-placed town of Kandy, the sacred mountain of Adam's Peak, the sanitarium of Nuwara Eliya and the hill-districts where the European planters have their houses, and the whole railway-system. This is the Ceylon of the English capitalist and planter, of the poet and the tourist; it is a rich sunny land, with perpetual summer, unfailing streams, and a teeming population, to whom life is easy and Nature bountiful. But there is another and a larger Ceylon, little thought about in England, but comprising the whole north and east, and parts of the centre and west of the island. There the country is thickly covered with sombre jungle, population is sparse, and cultivation is in most parts scanty and dependent on artificial irrigation. It is in these great tracts of beautiful but monotonous forest which extend across the whole island that the remains of the great cities of the past are situated, whose gigantic and imposing ruins half-buried and overgrown with jungle still tower above the forest-trees. Besides the Government officials, few Englishmen, save an occasional sportsman, naturalist, or antiquarian, visit this country, but in any physical account of the island it must receive due consideration.

The striking differences in these *two* Ceylons are due entirely to climate, and especially to rainfall. The distribution of rainfall, as shown by the number of inches falling annually, is exhibited in the map on the wall by various shades of blue coloration, and you must at once be struck with the marked superiority of the S.W. portion, of which I have spoken, over the rest of the island. This is explained by the conformation of the country; the lofty forest-clad escarpment of the mountain mass rises to over 7000 ft. (and there are still higher hills behind), and receives the full effects of the moisture-laden S.W. monsoon wind, which blows here for four or five months in the year, commencing with the end of May. During June and July especially, an immense quantity of rain falls over this part, especially in the hill-region round Adam's Peak, where in places over 200 inches fall in the year. In speaking of rainfall it must, however, always be borne in mind that the annual fall taken as a whole gives us but little information as to real climate. It is the *distribution* of the rain through the year that has so great an influence on fertility, especially in tropical countries; and in this favoured part there are rarely any long periods without rain. A month's or six weeks' drought in February, March, or April, is the utmost experienced, and this is rarely absolute; during the rest of the year there are frequent showers in nearly every week.

In the remainder of the island the case is widely different; the south-west monsoon, which so blesses the corresponding part of Ceylon, is now emptied of its moisture, and becomes a dry wind over the rest of its course across the island; and during the time when the Western Province and the hill-country are saturated, a scorching drought prevails elsewhere, and usually continues until the arrival of the N.E. monsoon in October. This wind brings rain to the whole island; there is no escarpment of the mountain plateau in that direction, and during the three or four months that

it blows all parts of Ceylon obtain more or less abundant rain. In many parts, however, of the north-west and east it all falls during a very short period, and the rest of the year is dry; thus, though the annual amount appears at a pretty good figure, it is not proportionally beneficial, the country being completely under water for a few weeks, and parched with drought for the remainder of the year. We see, then, how important it is to clearly understand that, as regards rainfall, Ceylon possesses two distinct climatic regions, which may be conveniently termed the *wet* and the *dry* districts, and are separated or connected by a high mountain mass. In this respect Ceylon is an epitome or continuation of the Indian peninsula, which similarly presents in its Malabar or western coast and in the Coromandel or eastern shore quite the same climatic differences, abruptly separated and caused by the chain of the Western Ghauts, which terminates at Cape Comorin.

We shall now be prepared, if we turn to the flora of Ceylon, to find a great difference in the vegetable productions of these strongly marked climatic districts; and this is in fact the case.

Let us first examine briefly the general character of the vegetation of the WET LOW COUNTRY. To anyone unfamiliar with tropical vegetation the first impressions of the towns of Colombo or Galle and their surroundings are those of surprise and admiration. The predominance of Palms, the Coconut being of course pre-eminent; but the smaller and perhaps more beautiful Areca-nut Palm, and the feathery Jaggery or Kitul Palm (*Caryota urens*), almost equally abundant, is characteristic; and scarcely less so are the masses of yellow-stemmed Bamboos (*Bambusa vulgaris*, var.), and the Cycads (*Cycas circinalis*). All these are types of vegetation essentially non-European; and so, too, are the fruit-trees which everywhere meet the eye, the great prickly fruits of the Jak dependent from the trunk and branches of the tree (*Artocarpus integrifolia*), the smaller Bread-fruit (*A. incisa*), the Mangoes, Papaws, Custard Apples, Nutmegs, Mangosteens, Cashew-nuts, and many others. The compounds and native gardens are ablaze with Flamboyante-trees (*Poinciana regia*), Lettuce-trees (*Pisonia morindifolia*), masses of the so-called "Crotons" (*Codiæum*), and bright-coloured creepers (*Petræa*, *Clerodendron*, *Ipomæas*, &c.). It is, however, of course scarcely necessary to say here that by far the greater part of the trees and shrubs which produce all this splendour are not natives of Ceylon at all. This is one of the things which it is very difficult to get persons who have paid little attention to botanical matters to understand or appreciate: if one asks an observant traveller of this kind to mention the most characteristic trees or shrubs of Ceylon, he will probably give you a list three-quarters of which are foreigners, and at least one-half unknown in the Old World before the discovery of America. Most of those just mentioned, and other familiar trees, such as the Guava, the Country Almond (*Terminalia Catappa*), the Blimbing (*Averrhoëa Bilimbi*), the Papaw, the Tamarind, and the Horse-radish tree (*Moringa pterygosperma*), are of exotic origin, and introduced by man. No doubt some are very ancient introductions, as the Jak from India and the Areca Palm from the Malay Peninsula; but

many are much more recent and from the West Indies or Tropical America. And here the trees commonly found by the Buddhist temples are worth a word of notice, as they too, curiously enough, are mostly of foreign origin. Of these the most familiar is the Bo-tree (*Ficus religiosa*), an object of veneration in itself as being the tree under which, sitting in contemplation, Siddartha attained Buddha-hood. I have never seen a tree of this in a situation which suggested nativity, and it is possible that the ancient tree at Anurdhapura brought from India B.C. 288, and still visited by thousands of devotees, is the parent of all the trees in Ceylon. The presentation of flowers on the altars being a prominent part of the simple worship of the Buddhist, most of the trees planted round the temples are such as afford suitable blossoms, yellow or white in colour, and by choice sweet-scented. Of these *Plumeria acutifolia* is the most familiar, and is universally known as the "Temple Tree." As this is undoubtedly South American, it cannot be an ancient importation, and was probably introduced by the Portuguese, but I have not met with any record of this. The flowers have a delicious if rather overpowering odour; the tree never produces seed in Ceylon. Another favourite tree in the temple compounds is *Cochlospermum Gossypium* with very brilliant yellow flowers, no doubt an introduction from India. The common weeds which line the roadsides and cover waste places are of similar origin; they are such as the Cactus (*Opuntia Dillenii*), the yellow *Turnera* (*T. ulnifolia*), the Marvel of Peru (*Mirabilis*), the pretty *Thunbergia alata*, the pink or white *Vinca rosea*, the *Allamanda*, and a hundred others, prominent among which is the ubiquitous *Lantana* from the W. Indies, and a fine Sunflower from Mexico (*Tithonia diversifolia*). All are foreign and by far the greater part from the New World, and many introduced quite recently. This invasion of the Eastern Tropics by an army of herbaceous half-shrubby weeds from the W. Indies is a remarkable fact. It has had the effect of causing a very uniform character in the vegetation of the cultivated coast regions of the whole tropical belt, and it would not now be possible in many cases to even guess the origin of many species from their present distribution; generally, however, their history can be traced without much difficulty through the botanical treatises of the 16th and 17th centuries. It is the clearing of land for cultivation that gives these alien plants their opportunity. A country like Ceylon, naturally covered with forest, has no native species able to compete with those foreign inhabitants of open country and plains, which, when once introduced, are thus able to spread without hindrance. The rapidity with which some useful or ornamental species were transported from the New World to the Old is very striking. The Portuguese came first to Java in 1496, four years after the discovery of America; and to Ceylon in 1505. In 1520 Magellan sailed direct from S. America to the Philippines. American plants were at once introduced there, and it was from these islands that the other Eastern Tropics obtained many of the plants now so abundant.

It will not be necessary to say much more about these exotic

species, which must of course be left out of account in considering the real flora of the country. It is chiefly in this low moist district that they are so frequent. No doubt the whole of this part of Ceylon was once covered with heavy forest; but most of this has now disappeared, and the country is thickly inhabited. The lower lands are mostly devoted to paddy (*i. e.*, rice) cultivation, and the more elevated parts between are occupied by villages, the sites of which are always to be recognised by cultivated trees, such as the tall Coco-nuts, the Bread-fruits and Jaks, and especially by the conspicuous white floral-leaves of the Kakuna (*Aleurites triloba*), (originally native to the Pacific Isles), and much grown for its oil, which, however, kerosine is rapidly supplanting. Other ornamental trees, often seen in the villages and looking like natives, are the *Cananga odorata*, or Ilang-ilang tree, and the Champak or Sapu (*Michelia Champaca*), both with delightfully fragrant yellow blossoms. It is in such villages also that the magnificent Talipot Palm (*Corypha umbraculifera*) is usually found, surely the grandest of the whole Palm-family. It is very difficult to decide whether or no this is native to Ceylon. From appearance one would say it was not so, as it is now never found in truly wild forest, and is in fact usually planted, the leaves being greatly used for coverings of all sorts, and, when cut into strips (olas), for writing upon. Yet it is found elsewhere only in Malabar, and there, too, under similar conditions; and I am inclined to consider it as an originally native inhabitant of some of our low-country forests, possibly local and rare, which has been preserved from extinction by cultivation.

(To be continued.)

A NEW *AMORPHOPHALLUS* FROM GAMBIA.

By H. N. Ridley, M.A., F.L.S.

In a box of plants sent in 1885 from Bathurst in Gambia, by Mr. J.R. Maxwell, to the Natural History Museum, were fruits and tubers of a species of *Amorphophallus*. As the tubers appeared alive they were entrusted to the care of Mr. Veitch, who cultivated them successfully. Several threw up leaves, and last June one produced flowers, the leaves not appearing till after the flower-spike was withered. The plant appears not to have been described, and is certainly one of the most insignificant of the genus. The scape, spathe, and spadix were of an almost uniform dull purplish brown or plum-colour, the leaves entirely of a bright green, the petioles being quite free from the marbling so common in the genus. The plant emits no odour when in flower.

Amorphophallus (§ *Hydrosme*) **Doryphorus, n. sp.**—Cormus pro planta magnus circiter 3 uncias diametro rotundato-compressue, radicibus albis longis crebris gracilibus. Folium singulum vel bina, hysteranthium bipedale ad basin ¾ uncia crassum; petiolus ½ uncia crassus ad basin viridis nec marmoratus; lamina lætevirens, nitida,

segmentis ovatis vel obovatis cuspidatis acutis, cuspide ½ uncia longa, basi confluentibus, nervis collectivis a margine remotis. Scapus strictus gracilis pallide virescenti-brunneus, teres, vix 13 uncias altus. Spatha subcylindrica basi paullulo ampliata, 3 uncias longa, pallide purpurascenti-brunnea, basi brunneo-striata, lamina acuminata. Spadix gracilis erectus spatham multo superans. Appendix cylindricus subacutus, 2½ uncia longus, purpurascenti-brunneus. Spica mascula cylindrica vix uncia longa; antheræ oblongæ quadratæ, poris duobus, cum appendice concoloræ. Spica feminea ½ uncia longa viridis, pistillorum apices subcompressi. Baccæ coccineæ, majusculæ.

Island of St Mary's, Gambia. J. R. Maxwell.

SHORT NOTES.

Potamogeton fluitans Roth. in Cambridgeshire. — In the Botanical Exchange Club Report for 1884, p. 111, Mr. Arthur Bennett notices, under the above name, a plant sent to him in June, 1884, from Ramsey, Hunts. The same form has been found this season in two localities near Chatteris, in Prof. Babington's District 7 of Cambridgeshire. In the case of a species so little known to British botanists, and so difficult of determination in the absence of fruiting examples, it is especially unfortunate that the plant has not flowered with us since 1884, neither in its original Huntingdonshire station, nor in a pond at Chatteris, where it was planted in the autumn of that year, and where it has now formed a vigorous tuft, over a square yard in extent. Of the Cambridgeshire plant, three patches of which have been found, none was in flower, but the plants from all the stations so well agree in habit and leaf-structure with the Ramsey plant, named by Mr. Bennett, that there is no difficulty in assigning them to the same species. A root of *P. fluitans*, originally from the Loire, kindly sent by Mr. Bennett, was grown side by side with the Ramsey plant in the autumn of 1884, and the exact agreement of these two examples in all the mutations of autumnal growth, was strongly corroborative of Mr. Bennett's specific determination, since the autumnal and winter states of *Potamogeton* afford characters so constant and well-defined as to be only secondary in specific value to those obtained from the fruit. When the habit of growth of our fen plant has once been thoroughly grasped, it cannot easily be mistaken, in the field, for any other British species, except, perhaps, an extreme form of *P. Zizii*, which grows with it in one locality, and of which the leaves are sometimes all floating and sub-coriaceous, thus giving this form something the look of *P. fluitans*. But in the latter species the leaves all grow in one direction, stretched out side by side: this, together with their undulating margins, conveys the idea of streaming water, even in a perfectly stagnant pond! Those of *P. Zizii*, on the contrary, are spreading and fan-like in habit, in one form even appearing

like a rosette on the surface of the water. *P. natans* may be distinguished from *P. fluitans* by the divaricate growth of the broad coriaceous leaves of the former; these leaves being enabled, by the "joint" at the base of the lamina, to twist themselves into any vacant space on the surface of the water on which they float. Indeed, when growing uncrowded, so as to be able to develop themselves naturally, they often bend back from the foot-stalks until they are reversely parallel to the branch from whence they spring. These indications of habit are here given in the hope that they may enable field-botanists to detect *P. fluitans* in other parts of Eastern England. In stagnant waters like those of the fens it needs careful looking for, as it may be easily passed over amongst the rank vegetation, even in stations where it is known to grow, although in more congenial localities the plant likely enough may form conspicuous masses. The local distribution of *P. fluitans* is very remarkable, being quite unintelligible in relation to the present drainage systems of this part of the fens; but having regard to the ancient course of the "Old West Water" (a former branch of the Ouse) and its effluents, it seems not unlikely that the plant was brought into its present localities by that now dried-up river. Botanists who have opportunities of examining the upper reaches and backwaters of the Ouse, in the counties of Huntingdon and Bedford, may probably find the source whence our plant has descended into the fenland. On present knowledge, I am inclined to regard it rather as a native of upland streams and rivers than of the stagnant waters of the fens, against the dense vegetation of which its habit of growth so ill enables it to contend. —Alfred Fryer.

Elymus arenarius in North Somerset.—At p. 284 the Rev. W. Moyle Rogers alludes to this plant having been reported from North Somerset on unknown authority. The facts connecting this grass with the latter vice-county are as follows. Until recently its relation with the county of Somerset rested solely on a MS. of the late Mr. J. C. Collins, on whose authority the 'Supplement to the New Botanists' Guide' brackets the plant with four allied grasses, "all found at Burnham, Berrow, and Steart." Mr. Watson's comment in 'Topographical Botany' is that the county is "not very unlikely, yet seems to require confirmation." So, of course, I thought myself fortunate when, one August, a few years ago, I found a small patch on the North Somerset shore of the Bristol Channel, about a dozen miles to the north-east of Mr. Collins' stations. The plant grew on the shingle, above high-water mark, and though the quantity was little its stature was luxuriant. Two years later I again visited the spot, but soon afterwards it was destroyed by, as I supposed, the trampling of cattle from an adjoining pasture. Specimens are in my herbarium.—J. Walter White.

This plant was collected several years since by the late Rev. J. C. Collins, of St. John's Vicarage, Bridgwater, on the high sand-hills between Burnham and Brean Down. I observed a specimen in his herbarium in 1853, gathered in this locality. I have also

seen it on the same tract of sand-hills, but very sparingly, in company with *Psamma arenaria* R. & S.; and may add that *E. arenarius* L. was likewise gathered at Burnham in 1870 by Mr. Cosmo Melvill.—T. Bruges Flower.

Flora of Colonsay and Oransay.—Tbe following plants were noticed by me in Colonsay and Oransay, in August last, and are not recorded in Mr. Grieve's lists (Journ. Bot. 1881, pp. 155 and 312). Those marked * are new to the vice-county (South Ebudes, No. 102):—

Ranunculus sceleratus. Stream near Oransay Priory.
Trollius europæus.
Papaver dubium.
*Fumaria confusa. Field near Kiloran Bay.
*Cochlearia danica.
Polygala vulgaris.
Cerastium glomeratum.
*Spergularia marginata. Kiloran Bay.
*Geranium columbinum. Roadside, Kilchattan.
Sarothamnus scoparius.
Trifolium medium.
T. repens.
T. procumbens.
Lotus major.
Vicia hirsuta.
[V. sativa.]
Rubus corylifolius.
Circæa alpina (?).
Callitriche platycarpa. Ditch near Scallasaig.
Ægopodium Podagraria.
Œnanthe Lachenalii. A curious dwarf form; Oransay.
[Sambucus nigra.]
Senecio sylvaticus.
Hieracium murorum.
H. vulgatum.
Veronica serpyllifolia.
V. Beccabunga.
*Scutellaria minor. Bog off high-road between Scallasaig and Oransay.
Stachys sylvatica.
Galeopsis versicolor.
G. Tetrahit.
*Lamium incisum. Fields, Oransay.
Pinguicula lusitanica.
Urtica urens.
Juniperus nanus (?).
Sparganium ramosum.
*Potamogeton natans. Stream, Kiloran Bay.
Triglochin palustre.
Listera ovata.
Scirpus uniglumis.
S. pauciflorus.
Carex arenaria.
C. ovalis.
Phleum pratense.
Aira cæspitosa.
A. flexuosa.
A. præcox.
Triodia decumbens.
*Sclerochloa loliacea. Ruins, Oransay Priory, and on rocky coast, Oransay.
Lolium perenne.

W. F. Miller.

Rubus pallidus W. & N. in Britain.—In September, 1885, I found a *Rubus* in a copse in Sprowston, Norfolk, E., which answered no description within my reach. I submitted it to Dr. Focke, who named it as above, and stated it to be quite different from the *pallidus* of Babington's Manual. I venture to add a description, in the hope that this notice may appear in time to enable other botanists to search for it this season. The copse in which I found it is rather shady and damp, but not at all wet. The bramble grows rather rank, making a tangled bush, about four

feet high. Its thin glabrate leaflets and barren stem, rather like that of *scaber*, to which it is nearly allied, are features that readily catch the eye.

R. PALLIDUS W. & N. (sec. Nyman = *R. obliquus* Wirtg.):—Stem arcuate, angular, not furrowed, hairy and setose; prickles slender, weak, declining from a narrow compressed base, uniformly pale; leaves quinate; leaflets thin, patently dentate, green and *very* thinly hairy on both sides, obovate, acuminate, mostly cordate; panicle lax, leafy, hairy, interrupted; rachis wavy, setose, its prickles more slender and declining; sepals reflexed, triangular-acuminate; fruit small, often undeveloped under shade.—E. F. LINTON.

SENECIO SQUALIDUS Linn. IN SOUTH SOMERSET.—This plant had long been recorded on very doubtful authority for Somerset, but I have recently received specimens through the kindness of Dr. R. C. A. Prior, of Halse, who informs me it has become quite naturalized on walls about Taunton. It was first recorded for the county by the late Dr. Southby, of Bulford, Wilts, in 1820.—T. BRUGES FLOWER.

THE AGE OF SOME EXISTING SPECIES OF PLANTS:

BEING THE ADDRESS TO THE BIOLOGICAL SECTION OF THE BRITISH ASSOCIATION AT BIRMINGHAM, 1886.

BY WILLIAM CARRUTHERS, Pres. L.S., F.R.S., President of the Section.

With additions by the Author.

IN detaining you a few minutes from the proper work of the Section, I propose to ask your attention to what is known of the past history of the species of plants which still form a portion of the existing flora. The relation of our existing vegetation to preceding floras is beyond the scope of our present inquiry: it has been frequently made the subject of exposition, but to handle it requires a more lively imagination than I can lay claim to, or perhaps than it is desirable to employ in any strictly scientific investigation.

The literature of science is of little, if any, value in tracing the history of species, and in determining the modification or the persistency of characters which may be essential or accidental to them. If help could be obtained from this quarter, botanical inquiry would be specially favoured, for the literature of botany is earlier, and its terms have all along been more exact than in any of her sister sciences. But even the latest descriptions, incorporating as they do the most advanced observations of science, and expressed in the most exact terminology, fail to supply the data on which a minute comparison of plants can be instituted. Any attempt to compare the descriptions of Linnæus and the earlier systematists who, under his influence, introduced greater precision into their language, with the standard authors of our own day,

would be of no value. The short, vague, and insufficient descriptions of the still earlier botanists cannot even be taken into consideration.

Great precision might be expected from the illustrations that have been in use in botanical literature from the earliest times; but these supply no better help in the minute study of species than the descriptions which they are intended to aid. The earliest are made to do duty for several species, and not a few are purely illustrations are extremely rude: many of them are misplaced; some fictitious. The careful and minutely exact illustrations which are to be found in many modern systematic works are too recent to supply materials for detecting any changes that may have taken place in the elements of a flora.

But the means of comparison which we look for in vain in the published literature of science may be found in the collections of dried plants which botanists have formed for several generations. The local herbaria of our own day represent not only the different species found in a country, but the various forms which occur together with their distribution. They must supply the most certain materials for the minute comparison at any future epoch of the then existing vegetation with that of our own day.

The preservation of dried plants as a help in the study of systematic botany was first employed in the middle of the sixteenth century. The earliest herbarium of which we have any record is that of John Falconer, an Englishman who travelled in Italy between 1540 and 1547, and who brought with him to England a collection of dried plants fastened in a book. This was seen by William Turner, our first British botanist, who refers to it in his 'Herbal,' published in 1551. Turner may have been already acquainted with this method of preserving plants, for in his enforced absence from England he studied at Bologna under Luca Ghini, the first professor of Botany in Europe, who, there is reason to believe, originated the practice of making herbaria. Ghini's pupils, Aldrovandus and Cæsalpinus, formed extensive collections. Caspar Bauhin, whose 'Prodromus' was the first attempt to digest the literature of botany, left a considerable herbarium, still preserved at Basle. No collection of English plants is known to exist older than the middle of the seventeenth century; a volume containing some British and many exotic plants collected in the year 1647 was some years ago acquired by the British Museum. Towards the end of that century great activity was manifested in the collection of plants, not only in our own country, but in every district of the globe visited by travellers. The labours of Ray and Sloane, of Petiver and Plukenet are manifest not only in the works which they published, but in the collections that they made, which were purchased by the country in 1759 when the museum of Sir Hans Sloane became the nucleus of the now extensive collections of the British Museum. The most important of these collections in regard to British plants is the herbarium of Adam Buddle, collected nearly two hundred years ago, and containing an extensive series, which formed the basis of a British

Flora, that unhappily for science was never published, though it still exists in manuscript. Other collections of British plants of the same age, but less complete, supplement those of Buddle: these various materials are in such a state of preservation as to permit of the most careful comparison with living plants, and they show that the two centuries which have elapsed since their collection have not modified in any particular the species contained in them. The early collectors contemplated merely the preservation of a single specimen of each species; consequently the data for an exhaustive comparison of the indigenous flora of Britain at the beginning of last century with that of the present are very imperfect as compared with those which we shall hand down to our successors for their use.

The collections made in other regions of the world in the seventeenth century, and included in the extensive herbarium of Sir Hans Sloane, are frequently being examined side by side with plants of our own day, but they do not show any peculiarities that distinguish them from recent collections. If any changes are taking place in plants, it is certain that the three hundred years during which their dried remains have been preserved in herbaria have been too short to exhibit them.

Beyond the time of those early herbaria the materials which we owe in any way to the intervention of man have been preserved without any regard to their scientific interest. They consist mainly of materials used in building or for sepulture. The woods employed in mediæval buildings present no peculiarities by which they can be distinguished from existing woods; neither do the woods met with in Roman and British villages and burying-places. From a large series collected by General Pitt-Rivers in extensive explorations carried on by him on the site of a village which had been occupied by the British before and after the appearance of the Romans, we find that the woods chiefly used by them were oak, birch, hazel, and willow, and at the latter period of occupation of the village the wood of the Spanish chestnut (*Castanea vulgaris* Lam.) was so extensively employed that it must have been introduced and grown in the district. The gravel-beds in the north of London, explored by Mr. W. G. Smith for the palæolithic implements in them, contained also stems and leaves of *Clematis Vitalba* L., willow and birch, the foliage and fruit of *Corylus Avellana* L., and *Alnus glutinosa* L. and the rhizomes of *Osmunda regalis* L., none of which can be distinguished from the plants of our own day. Mr. Mahoney has found at Windmillcroft, near Glasgow, associated with objects of human workmanship, the remains of oak, ash, beech, hawthorn, wych-elm and hazel, together with thirteen of the more common species of our existing mosses.

The most important materials, however, for the comparison of former vegetation of a known age with that of our own day have been supplied by the specimens which have been obtained from the tombs of the ancient Egyptians. Until recently these consisted mainly of fruits and seeds. These were all more or less carbonised, because the former rifling of the tombs had exposed them to the

air. Ehrenberg, who accompanied Von Minutoli in his Egyptian expedition, determined the seeds which he had collected, but as he himself doubted the antiquity of some of the materials on which he reported, the scientific value of his enumeration is destroyed. Passalacqua, in 1823, made considerable collections from tombs at Thebes, and these were carefully examined and described by the distinguished botanist Kunth. He pointed out, in a paper published sixty years ago, that these ancient seeds possessed the minute and apparently accidental peculiarities of their existing representatives. Unger, who visited Egypt, published in several papers identifications of the plant-remains from the tombs; and one of the latest labours of Alexander Braun was an examination of the vegetable remains inthe Egyptian Museum at Berlin, which was published, after his death, from his manuscript, under the careful editorship of Ascherson and Magnus. In this, twenty-four species were determined, some from imperfect materials, and necessarily with some hesitation as to the accuracy of their determination.

The recent exploration of unopened tombs belonging to an early period in the history of the Egyptian people has permitted the examination of the plants in a condition which could not have been anticipated. And happily, the examination of these materials has been made by a botanist who is thoroughly acquainted with the existing flora of Egypt, for Dr. Schweinfurth has for a quarter of a century been exploring the plants of the Nile valley. The plant-remains were included within the mummy-wrappings, and being thus hermetically sealed, have been preserved with scarcely any change. By placing the plants in warm water, Dr. Schweinfurth has succeeded in preparing a series of specimens gathered four thousand years ago, which are as satisfactory for the purposes of science as any collected at the present day. These specimens consequently supply means for the closest examination and comparison with their living representatives. The colours of the flowers are still present, even the most evanescent, such as the violet of the larkspur and knapweed, and the scarlet of the poppy; the chlorophyll remains in the leaves, and the sugar in the pulp of the raisins. Dr. Schweinfurth has determined no less than fifty-nine species,* some of which are represented by the fruits employed

* List of the species of ancient Egyptian plants determined by Dr. Schweinfurth. I am indebted to Dr. Schweinfurth for some species in this list, the discovery of which he has not yet published:— *Delphinium orientale* Gay, *Cocculus Leaba*, DC., *Nymphæa cærulea* Sav., *Nymphæa Lotus* Hook., *Papaver Rhœas* L., ***Sinapis arvensis* L. var. *Allionii*** Jacq., *Moringa uniflora* Vahl., *Oncoba spinosa* Forsk., *Tamarix nilotica* Ehrenb., *Alcea ficifolia* L., *Linum humile* Mill., *Balanites ægyptiaca* Del., *Vitis vinifera* L., *Moringa aptera* Gærtn., *Medicago denticulata* Willd., *Sesbania ægyptiaca* Pers., *Faba Vicia* L., *Lens esculenta* Mœnch, *Lathyrus sativus* L., *Cajanus indicus* L., *Acacia nilotica* Del., *Lawsonia inermis* Lam., *Punica Granatum* L., *Epilobium hirsutum* L., *Lagenaria vulgaris* Ser., *Citrullus vulgaris* Schrad. var. *colocynthoides* Schweinf., *Apium graveolens* L., *Coriandrum sativum* L., *Ceruana pratensis* Forsk., *Sphæranthus suaveolens* DC., *Chrysanthemum coronarium* L., *Centaurea depressa* M. Bieb., *Carthamus tinctorius* L., *Picris coronopifolia* Asch., *Mimusops Schimperi* Hochst., *Jasminum Sambac* L., *Olea europæa* L., *Mentha piperita* L., *Rumex dentatus* L., *Ficus*

as offerings to the dead, others by the flowers and leaves made into garlands, and the remainder by branches on which the body was placed, and which were inclosed within the wrappings.

The votive offerings consist of the fruits, seeds, or stems of twenty-nine species of plants. Three palm fruits are common; the *Medemia Argun* Würt. of the Nubian Desert, and the *Hyphæne thebaica* Mart. of Upper Egypt, agreeing exactly with the fruits of these plants in our own day; also dates of different forms resembling exactly the varieties of dried dates found now in the markets of Egypt. Two figs are met with, *Ficus Carica* L. and *Ficus Sycomorus* L., the latter exhibiting the incisions still employed by the inhabitants for the destruction of the neuropterous insects which feed on them. The sycamore was one of the sacred trees of Egypt, and the branches used for the bier of a mummy found at Abd-el-Qurna, of the twentieth dynasty (a thousand years before the Christian era), were moistened and laid out by Dr. Schweinfurth, equalling, he says, the best specimens of this plant in our herbaria, and consequently permitting the most exact comparison with living sycamores, from which they differ in no respect. The fruit of the vine is common, and presents, besides some forms familiar to the modern grower, others which have been lost to cultivation. The leaves which have been obtained entire exactly agree in form with those cultivated at the present day, but the under surface is clothed with white hairs, a peculiarity Dr. Schweinfurth has not observed in any Egyptian vines of our time. A very large quantity of linseed was found in a tomb at Thebes of the twentieth dynasty, now three thousand years old, and a smaller quantity in a vase in another tomb of the twelfth dynasty, that is, one thousand years older. This belongs certainly to *Linum humile* Mill., the species still cultivated in Egypt, from which the capsules do not differ in any respect. Braun had already determined this species preserved thus in the tombs, though he was not aware of its continued cultivation in Egypt. The berries of *Juniperus phœnicea* L. are found in a perfect state of preservation, and present a somewhat larger average size than those obtained from this juniper at the present day. Grains of barley and wheat are of frequent occurrence in the tombs; M. Mariette has found barley in a grave at Sakhara of the fifth dynasty, five thousand four hundred years old.

The impurities found with the seeds of these cultivated plants show that the weeds which trouble the tillers of the soil at the present day in Egypt were equally the pests of their ancestors in those early ages. The barley fields were infested with the same spiny medick (*Medicago denticulata* Willd.) which is still found in the grain crops of Egypt. The presence of the pods of *Sinapis arvensis* L. among the flax seed testifies to the presence of this

---

Sycomorus L., *F. Carica* L., *Salix Safsaf* Forsk., *Juniperus phœnicea* L., *Pinus Pinea* L., *Allium sativum* L., *A. Cepa* L., *Phœnix dactylifera* L., *Calamus fasciculatus* Roxb., *Hyphæne thebaica* Mart., *Medemia Argun* Würt., *Cyperus Papyrus* L., *C. esculentus* L., *Andropogon laniger* Desf., *Leptochloa bipinnata* Retz., *Triticum vulgare* L., *Hordeum vulgare* L., *Parmelia furfuracea* Asch., *Usnea plicata* Hoffm.

weed in the flax crops of the days of Pharaoh, as of our own time. There is not a single field of flax in Egypt where this charlock does not abound; and often in such quantity that its yellow flowers, just before the flax comes into bloom, present the appearance of a crop of mustard. The charlock is *Sinapis arvensis* L., var. *Allioni* Jacq., and is distinguished from the ordinary form by its globular and inflated silicules, which are as characteristically present in the ancient specimens from the tombs as in the living plants. *Rumex dentatus* L., the dock of the Egyptian fields of to-day, has been found in graves of the Greek period at Dra-Abu-Negga.

It is difficult without the actual inspection of the specimens of plants employed as garlands, which have been prepared by Dr. Schweinfurth, to realise the wonderful condition of preservation in which they are. The colour of the petals of *Papaver Rhœas* L. and the occasional presence of the dark patch at their bases present the same peculiarities as are still found in this species growing in Egyptian fields. The petals of the larkspur (*Delphinium orientale* Gay) not only retain their reddish-violet colour, but present the peculiar markings which are still found in the living plant. A garland composed of wild celery (*Apium graveolens* L.), and small flowers of the blue lotus (*Nymphæa cærulea* Sav.), fastened together by fibres of papyrus, was found on a mummy of the twentieth dynasty, about three thousand years old. The leaves, flowers and fruits of the wild celery have been examined with the greatest care by Dr. Schweinfurth, who has demonstrated in the clearest manner their absolute identity with the indigenous form of this species now abundant in moist places in Egypt. The same may be said of the other plants used for garlands, including two species of lichens.

It appears to have been a practice to lay out the dead bodies on a bier of fresh branches, and these were inclosed within the linen wrappings which enveloped the mummy. In this way there have been preserved branches of considerable size of *Ficus Sycomorus* L., *Olea europæa* L., *Mimusops Schimperi* Hochst., and *Tamarix nilotica* Ehrenb. The Mimusops is of frequent occurrence in the mural decorations of the ancient temples; its fruit had been detected amongst the offerings to the dead, and detached leaves had been found made up into garlands, but the discovery of branches with their leaves still attached, and in one case with the fruit adhering, has established that this plant is the Abyssinian species to which Schimper's name has been given, and which is characterised by the long and slender petiole of the leaf.

In none of the species, except the vine to which I have referred, which Dr. Schweinfurth has discovered, and of which he has made a careful study, has he been able to detect any peculiarities in the living plants which are absent in those obtained from the tombs.

Before passing from the Egyptian plants I would draw attention to the quality of the cereals. They are good specimens of the cereals still cultivated. This observation is true also of the cultivated grains which I have examined, belonging to prehistoric times. The wheat found in the purely British portion of the

ancient village explored by General Pitt-Rivers is equal to the average of wheat cultivated at the present day. This is the more remarkable, because the two samples from the later Romano-British period obtained by General Pitt-Rivers are very much smaller, although they are not unlike the small hard grains of wheat still cultivated on thin chalk soils. The wheat from lake-dwellings in Switzerland, for which I am indebted to J. T. Lee, Esq., F.G.S., are fair samples. My colleague Mr. W. Fawcett has recently brought me from America grains of maize from the prehistoric mounds in the valley of the Mississippi, and from the tombs of the Incas of Peru, which represent also fair samples of this great food substance of the New World. The early peoples of both worlds had then under cultivation productive varieties of these important food-plants, and it is remarkable that in our own country, with all the appliances of scientific cultivation and intelligent farming, we have not been able to appreciably surpass the grains which were harvested by our rude ancestors of two thousand years ago.

In taking a further step into the past, and tracing the remains of existing species of plants preserved in the strata of the earth's crust, we must necessarily leave behind all certain chronology. Without an intelligent observer and recorder there can be no definite determination of time. We can only speculate as to the period required for effecting the changes represented by the various deposits.

The peat-bogs are composed entirely of plant-remains belonging to the floras existing in the regions where they occur. They are mainly surface accumulations still being formed and going back to an unknown antiquity. They are subsequent to the last changes in the surface of the country, and represent the physical conditions still prevailing.

The period of great cold during which arctic ice extended far into temperate regions was not favourable to vegetable life. But in some localities we have stratified clays with plant-remains later than the Glacial Epoch, yet indicating that the great cold had not then entirely disappeared. Several plant-bearing beds resting on the Boulder Clay have been investigated in the valley of the Clyde. Mr. Mahoney has recorded an interesting marsh flora from Crofthead, Renfrewshire, consisting of two species of *Desmidieæ*, thirty-one of *Diatomaceæ*, and nine species of flowering plants, all belonging to the existing "agrarian" flora. The most important examination of these beds has, however, been made by Mr. David Robertson, F.L.S., who has thoroughly investigated the contents of the strata explored in the excavation of the Dry Dock, Garvel Park, Greenock. It is evident that these beds record an earlier phase of life than the beds at Crofthead. The arctic shells are associated with the plant-bearing beds, and the plants themselves, while consisting to a large extent of "agrarian" species, include a number of arctic or alpine forms. The remains of flowering plants, representing apparently fourteen species, were too fragmentary to permit of specific identification. No less than fifty-one

species of mosses have been determined with certainty, a considerable proportion being alpine plants, one, *Barbula aciphylla* Br. & Sch. is no longer found in Britain, though growing on mountains in Europe, and another, *Cynodontium virens* Hedw., is represented by many specimens of a variety (*compactum*) known in our day only from the Dovrefeld in Norway, and the Col de Stelvio in the Alps. These beds also contained seven species of seaweeds which are now found in our seas. In the lacustrine beds at Holderness is found a small birch (*Betula nana* L.) now limited in Great Britain to some of the mountains of Scotland, but found in the Arctic regions of the Old and New World and on Alpine districts in Europe, and with it *Prunus Padus* L., *Quercus Robur* L., *Corylus Avellana* L., *Alnus glutinosa* L., and *Pinus sylvestris* L. In the white clay beds at Bovey Tracey of the same age there occur the leaves of *Arctostaphylos Uva-Ursi* L., three species of willow, viz., *Salix cinerea* L., *S. myrtilloides* L., and *S. polaris* Wahl., and in addition to our alpine *Betula nana* L., the more familiar *B. alba* L. In beds of the same age in Sweden, Nathorst has found the leaves of *Dryas octopetala* L., and *Salix herbacea* L., this being associated with *S. polaris* Wahl. Two of these plants have been lost to our flora from the change of climate that has taken place, viz., *Salix myrtilloides* L. and *S. polaris* Wahl.; and *Betula nana* L. has retreated to the mountains of Scotland. Three others (*Dryas octopetala* L., *Arctostaphylos Uva-ursi* L., and *Salix herbacea* L) have withdrawn to the mountains of Northern England, Wales, and Scotland, while the remainder are still found scattered over the country. Notwithstanding the diverse physical conditions to which these plants have been subjected, the remains preserved in these beds present no characters by which they can be distinguished from the living representatives of the species.

We meet with no further materials for careful comparison with existing species until we get beyond the great period of intense cold which immediately preceded the present order of things. The Glacial Epoch includes four periods during which the cold was intense, separated by intervals of somewhat higher temperature which are represented by the intervening sedimentary deposits. During these alterations of temperature, extensive changes in the configuration of the land were taking place. The first great upheaval occurred in the early glacial period, and was followed by a considerable subsidence. A second upheaval took place late in the Glacial Epoch. Various estimates have been formed of the time required for this succession of climatic conditions and earth-movements. The moderate computation of Ramsay and Lyell gives to the boulder clay of the first glacial period an age of 250,000 years, estimating the time of the first upheaval as 200,000 years ago, while the subsidence took place 50,000 years later, and the second upheaval 92,000 years ago.

The sedimentary deposits later than the Pliocene strata, but older than the glacial drift, indicate an increasing severity in the climate, which reached its height in the first glacial period.

At Cromer, on the Norfolk coast, the newest of these deposits

has supplied the remains of *Salix polaris* Wahl., *S. cinerea* L., and *Hypnum turgescens* Schimp. This small group of plants is of great interest in connection with the history of existing species; their remains are preserved in such a manner as to permit the closest comparison with living plants. Such an examination shows that they differ from each other in no particular. In the post-glacial deposits in Sweden, *Salix herbacea* L. is associated with *S. polaris* Wahl., as I have already stated. These two willows are very closely related, having indeed been treated as the same species until Wahlenberg pointed out the characters which separated them when he established *Salix polaris* as a distinct species in 1812. One of the most obvious of the specific distinctions is the form and venation of the leaf, a character which is, however, easily overlooked, but when once detected is found to be so constant that it enables one to distinguish without hesitation the one species from the other. The leaves of the two willows in the Swedish bed present all the peculiarities which they possess at the present day, and the venation and form of the leaves of *S. polaris* Wahl., from the preglacial beds of Cromer present no approach towards the peculiarities of its ally *S. herbacea* L., but exhibit them exactly as they appear in the living plant. This is the more noteworthy as the vegetative organs supply, as a rule, the least stable of the characters employed in the diagnosis of species. The single moss (*Hpynum turgescens* Schimp.) is no longer included in the British flora, but is still found as an arctic and alpine species in Europe, and the pre-glacial specimens of this cellular plant differ in no respect from their living representatives.

The older beds containing the remains of existing species, which are found also at Cromer, have recently been explored with unwearied diligence and great success by Mr. Clement Reid, F.G.S., an officer of the Geological Survey of England. To him I am indebted for the opportunity of examining the specimens which he has found, and I have been able to assist him in some of his determinations, and to accept all of them. His collections contain sixty-one species of plants belonging to forty-six different genera, and of these forty-seven species have been identified. Slabs of clay-ironstone from the beach at Happisburgh contain leaves of beech, elm, oak, and willow. The materials, however, which have enabled Mr. Reid to record so large a number of species are the fruits or seeds which occur chiefly in mud or clay, or in the peat of the forest bed itself. The species consist mainly of water or marsh plants, and represent a somewhat colder temperature than we have in our own day, belonging as they do to the arctic facies of our existing flora.

Only one species (*Trapa natans* L.) has disappeared from our islands; its fruits, which Mr. Reid found abundantly in one locality, agree with those of the plants found until recently in the lakes of Sweden. Three species (*Prunus spinosa* L., *Œnanthe Lachenalii* Gmel., and *Pinus Abies* L.) are found at present only in Europe, ; two species (*Peucedanum palustre* Mœnch. and *Pinus sylvestris* L.) are found also in Siberia, whilst five more (*Sanguisorba*

officinalis L., *Rubus fruticosus* L., *Cornus sanguinea* L., *Euphorbia amygdaloides* L., and *Quercus Robur* L.) extend into Western Asia, and two (*Fagus sylvatica* L. and *Alnus glutinosa* L.) are included in the Japanese Flora. Eight species, while found with the others, enter also into the Mediterranean flora, extending to North Africa: these are *Thalictrum minus* L., *T. flavum* L., *Ranunculus repens* L., *Stellaria aquatica* Scop., *Corylus Avellana* L., *Potamogeton trichoides* Cham., *Zannichellia palustris* L., and *Cladium Mariscus* Br.; while *Potamogeton heterophyllus* Schreb. has the same distribution, except that it has not been found in N. Africa. With a similar distribution in the Old World, eight species (*Bidens tripartita* L., *Myosotis cæspitosa* Schultz., *Suæda maritima* Dum., *Ceratophyllum demersum* L., *Sparganium ramosum* Huds., *Potamogeton pectinatus* L., *Carex paludosa* Good., and *Osmunda regalis* L.) are found also in North America. Of the remainder, ten species (*Nuphar luteum* Sm., *Menyanthes trifoliata* L., *Stachys palustris* L., *Rumex maritimus* L., *R. Acetosella* L., *Betula alba* L., *Scirpus pauciflorus* Lightf., *Taxus baccata* L., and *Isoetes lacustris* L.) extend round the north temperate zone, while three (*Lycopus europæus* L., *Alisma Plantago* L., and *Phragmites communis* Trin.), having the same distribution in the north, are found also in Australia, and one (*Hippuris vulgaris* L.) in the south of South America, while *Potamogeton crispus* is found in Africa, America, and Australasia. The list is completed by *Ranunculus aquatilus* L., distributed over all the temperate regions of the globe, and *Scirpus lacustris* L., which is found in many tropical regions as well.

The various physical conditions which necessarily affected these species in their diffusion over such large areas of the earth's surface in the course of, say, 250,000 years, should have led to the production of many varieties, but the uniform testimony of the remains of this considerable pre-glacial flora, as far as the materials admit of a comparison, is that no appreciable change has taken place.

I am unable to carry the history of any existing species of plant beyond the Cromer deposits. Some of the plant remains from Tertiary strata have been referred to still living species, but the examination of the materials, as far as they have come before me, convince me that this has been done without sufficient evidence, The physical conditions existing during even the colder of the Tertiary periods were not suitable to a flora fitted to persist in these lands in our day, even if the period of great cold had not intervened to destroy them. And in no warmer region of the earth do these Tertiary species now exist, though floras of the same facies occur, containing closely allied species. The sedimentary beds at the base of the Glacial Epoch contain, as far as we at present know, the earliest remains of any existing species of plant.

It is not my purpose to point out the bearing of these facts on any theoretical views entertained at the present day; I wish merely to place them before the members of this section as data which must be taken into account in constructing such theories, and as confirming the long-established axiom that by us, at least, as workers, species must be dealt with as fixed quantities.

NOTICES OF BOOKS.

Mr. M. J. Sutton has produced a handsome volume on 'Permanent and Temporary Pastures' (Hamilton & Adams), with descriptions and coloured figures of what agriculturists style "natural grasses"—under which name *Achillea Millefolium* appears to be included—and clovers. The letterpress deals with the subject from the standpoint of the practical farmer; it would have been much more useful, however, if figures of the seeds of different grasses had been given, so that allied species might be readily distinguished by the grower. The plates, by Mr. B. George, are many of them good; exception must, however, be taken to that of *Medicago lupulina*, which gives a very exaggerated idea of the plant.

New Books.—G. Camus, 'L'Opera salernitana "Circa instans" ed il testo primitivo del' grant Herbier en Francoys, secondo due codici del secolo xv., conservati nella regia biblioteca estense' (Modena: 4to, pp. 155).—A. Magnin, 'La Végétation de la Région Lyonnaise' (Geneva, Georg: 8vo, pp. xvi. 513: 7 maps.—T. Barrois, 'Role des insectes dans la fécondation des végétaux' (Paris, Doin: pp. 124, 24 figs.). — C. Capdeville, 'Étude sur le Piligan (*Lycopodium Saururus*)' (4to, pp. 52). — G. Sommer, 'Die Bäume und Sträucher der Grossl. Schlossgartenanlagen zu Karlsruhe' (Karlsruhe, Macklot: 8vo, pp. viii. 126).—F. Herder, 'Catalogus Bibliothecæ Hort. Imp. Bot. Petropolitani' (St. Petersburg: 8vo, pp. xi. 510). — A. Florence, 'Les Alcaloides des Solanées' (Lyon: 8vo, pp. 121).—J. C. Brown, 'School of Forest Engineers in Spain' (Edinburgh, Oliver & Boyd: 8vo, pp. xii. 232).

Articles in Journals.

American Naturalist (Sept.). — W. Matthews, 'Navajo Names for Plants.'

Bot. Centralblatt (Nos. 37, 38). — S. Korzchinsky. 'Ueber die Samen die *Aldrovanda vesiculosa*' (1 plate). — (No. 40). S. Dietz, 'Die Blüten- und Fruchtentwicklung bei *Typha* und *Sparganium*.'

Bot. Gazette (Aug.). — W. S. Lyon, 'The Flora of our Southwestern Archipelago.' — Ella L. Knowles, 'Structure and distribution of Resin-passages of White Pine' (*Pinus Strobus*) (1 plate). — B. W. Barton, 'Notes on *Campanula medium*.' — J. Reverchon, 'Botanizing in Texas.'—T. Meehan, 'Notes on *Arisæma triphyllum*.'

Bot. Notiser (häft. iv.). — 'Spridda bidrag till Nerikes flora.'—H. W. Arnell, 'Bryologiska notiser från det småländska höglandet.' —C. Kaurin, *Bryum Lindbergii*, n. sp.

Bot. Zeitung (Sept. 3). — J. Wortmann, 'Einige Bemerkungen zu der von Schwendener gegen meine Theorie des Windens gerichteten Erwiderung.' — (Sept. 10, 17, 24). J. Wortmann, 'Ueber die Natur der rotirenden Nutation der Schlingpflanzen.'

Bull. Soc. Bot. France (Sept. 1): tom. xxxii. Comptes-rendus 4). — A. Franchet, '*Rhododendron* du Thibet et du Yun-nan' (32 new species). — P. Vuillemin, 'Conjugaison des Mucorinées. — P. A. Daugeard, 'Un nouveau genre de Chytridinées' (*Sphærita*). — M. Gandoger, 'Plantes de la Judée.' — E. Blanc, 'Flore de Tunisie.'—P. van Tieghem & H. Doulot, 'Sur la sortie des racines latérales.' — J. Bourdette, 'Sur la Flore des Hautes-Pyrénées.'—L. Mangin, 'Sur les petales ovulifères du *Caltha palustris*.'—P. van Tieghem, 'Croissance de la racine dans les Nymphéacées.'—T. Caruel, 'Sur la nouvelle famille des Scutellariacées.' — L. Dufour, 'Influence de l'orientation sur la structure des feuilles.'

Bull. Torrey Bot. Club (Sept.). — T. Morong, '*Naiadaceæ* in the Torrey Herbarium' (*Potamogeton Wrightii*, n. sp.: t. 69).—G. Vasey, 'Synopsis of *Paspalum*' (*P. gigantеum* Baldw. (ined.); *P. Buckleyanum* Vasey, spp. nn.).—J. Schrenk, 'Dehiscence of Fern Sporangia.'

Flora (Sept. 1). — O. Bachmann, 'Untersuchungen über die systematische Bedeutung der Schildhaare.' — E. Zimmermann, 'Zur Kenntnis der Anatomie der *Helosis guyanensis*.'

Gardeners' Chronicle (Sept. 4). — *Cyrtopera Regnieri* Rchb. f., n. sp. — 'Cypripedium vagaries' (figs. 63–66). — A. D. Webster, '*Epipactis latifolia*.' — (Sept. 11). *Cypripedium callosum*, Rchb. f., n. sp.; *Oncidium Pollettianum*, n. sp. (hyb. nat.?) Rchb. f.— *Xanthochymus pictorius* (figs. 71, 72). — (Sept. 18). *Aristolochia ridicula* N. E. Br., n. sp. (fig. 73). — Proliferous Narcissus bulbs (fig. 76).— (Sept. 25). *Alocasia grandis* N. E. Br., n. sp.; *Zingiber brevifolium* N. E. Br., n. sp.—Semi-double *Cypripedium* (fig. 83).

Magyar Növénytani Lapok (May–July). — Obituary of C. Kalchbrenner. — K. Demeter, 'A Magyar Birodalom moh-florája.'— (Aug.). V. v. Borbás, 'Erdèly florá jának kis pótlèka.'—H. Braun, 'A Pozsonymegyei *Rosa Timeroyi*.'

Malpighia (July). — L. Errera, 'Pourquoi les éléments de la matière vivante ont-ils des poids atomiques peu élevés?' — S. Calloni, 'Architettura dei nettàri nell' *Erythronium Dens-canis*.'— A. Borzi, 'Sporidî sorediali di *Amphiloma murorum*.' — F. Morini, 'Richerche sopra una specie di *Aspergillus*.' — (Aug.). O. Helm & H. Conwentz, 'Sull' ambra di Sicilia.'— P. Baccarini, 'Le *Peronospora viticola* nel Settentrione d'Italia.' — G. B. de Toni & D. Levi, 'De Algis nonnullis, præcipue Diatomaceis, inter Nymphæaceas Horti Botanici Patavini.' — R. Pirolta, 'Sulle Isoetes dell' Agro romano.' — L. Nicotra, 'Intorno ad una pro posizione di Fitotopografia.' — A. Borzi, 'Le communicazione intracellulari delle Nostochinee.'

Oesterr. Bot. Zeitschrift (Aug.). — H. Sabransky, 'Zwei westungarische Brombeeren' (*Rubus Bollæ*, n. sp.). — V. v. Borbás, '*Potentilla obscura* et *leucotricha*.' — E. Formánek, 'Flora der Karpathen.' — J. Ullepitsch, '*Symphytum cordatum*.' — L. Schlögl, 'Der Pilzmarkt in Ung. Hradisch.'—P. G. Strobl, 'Flora des Etna.'

Neuwiedia calanthoides, *Ridl.*

Rob^t Morgan. lith

West, Newman & Co imp.

Appendicula disticha. *Ridl.*

ON THE MONOCOTYLEDONOUS PLANTS OF NEW GUINEA COLLECTED BY MR. H. O. FORBES.

By H. N. Ridley, M.A., F.L.S.

(Plates 270 & 271).

It is with much regret that we hear of Mr. Forbes' failure, from lack of funds, to accomplish the much-desired explorations of the Owen Stanley range of mountains in Central New Guinea. Few countries have proved so difficult of investigation from natural causes as New Guinea. The forests are of unusual thickness and impenetrability, and the whole island is cut up into precipitous mountains and valleys, difficult and tedious to cross. So great were the expenses consequent upon this, to which was added the loss of a considerable portion of the collecting apparatus by the foundering of a small vessel which was conveying it, that Mr. Forbes, after building a winter camp and preparing everything for the expedition, had to dismiss his men and return to Australia, having spent all the money supplied to him by the Australian and English Governments, together with a considerable sum from his own private resources. It is hoped that he may ere long make another attempt to penetrate this entirely unknown region, and that with the success that has attended his former expeditions in Sumatra, Timor, and other little-known islands of the Malayan Archipelago. In spite of the fact that the already received collections were of necessity made for the most part during the worst time of the year, *viz.*, in the months of October and November, the amount of striking novelties is very considerable, and gives a good idea of what we may expect to obtain if he contrives to explore the higher regions of the interior. The greater portion of the flowering plants are being described by Baron Von Mueller, who is probably better acquainted with the flora of this island than anyone else in the empire. The Monocotyledons will be treated of in this paper. All the specimens mentioned without collector's name are from Mr. Forbes, and are in the British Museum Herbarium. I have added some notes on the species obtained by George Barclay at Jobie Island (not Tobie Island, as erroneously printed in Lond. Journ. Bot. ii. 214 *et seq.*), and also on the mainland of New Guinea, many of which were entirely omitted from the accounts of the voyage of the 'Sulphur.'

The flora as represented by Mr. Forbes' collection is typically a forest one, and bears most relation to that of Amboina and Ceram. The few plants which (at least among the Monocotyledons) also occur in Australia are found besides in these islands.

Perhaps one of the most striking plants in the collection is *Tapeinochilus pubescens*, a new and very distinct species of this magnificent genus of Scitamineous plants. The original species, *T. pungens*, which also occurs in the collection, was based upon a plant obtained in Ceram, and has also been found in Australia;

while a figure of a plant in Rumphius, from Amboina, seems to be intended to represent it. Among the *Orchideæ* several interesting novelties are to be found, including the curious *Appendicula* represented on Plate 270, and some very beautiful species of *Dendrobium*, well worthy of cultivation. The *Apostasiaceæ* are represented by a new and striking species of *Neuweidia*, with narrow leaves, and a tall spike of yellow flowers. The difficult order of *Pandanaceæ* seems to be strongly developed in New Guinea, and several curious species of *Pandanus* and *Freycinetia* have been obtained.

Among the already described species are several till now insufficiently known. *Coelogyne Rumphii* was described by Dr. Lindley from a figure by Rumphius, and it has not been seen, so far as I am aware, since his time. The *Dendrobium foliosum* of the 'Voyage de la Coquille' appears not to have been met with again until now, and Mr. Forbes' specimens show that it is not a *Dendrobium*, but an *Eria*. The singular and aberrant *Dendrobium longicolle* Lindl., pescribed from a plant sent from Singapore by Cuming and flowered by Loddiges in 1840, now reappears in New Guinea.

Orchideæ.

Oberonia Hamadryas, n. sp. — Rhizoma diu repens, pseudobulbis remotis, uncia dissitis. Folia ensiformia falcata recurva bifaria 2 uncias longa $\frac{1}{4}$ uncia lata. Scapus ferme omnius racemosus 4–5 uncias longus glabra, radicole haud angulata. Flores copiosi laxiusculi patuli glabri. Bracteæ pedicellos breviter superantes lanceolatæ acutæ convolutæ pallidæ integræ. Sepala et petala lanceolata lorata obtusa deflexa, alba. Labellum in ambitu ovatum acutum aurantiacum trilobum, lobi laterales erecti breves, obtusi, lobus medius cordatus triangularis acutus. Columna recta semiteres aurantiaca. Anthera oblonga ovata obtusa.

South Cape.

O. hexaptera F. Muell., the only other species recorded from New Guinea, I have not seen. From the description it seems to be distinguished chiefly by the sharp wings of the rachis. *O. Hamadryas* has no wings, nor is the rachis distinctly angled.

Liparis longipes Lindley. — Sogere, 1800 ft., No. 394. A single fruiting specimen.

There was also in the collection a *Liparis* of the section *Platystylis*, possibly *L. decurrens* Lindl., without fruit or flowers, having been sent accidentally upon the branch of a tree.

Dendrobium (§ Cadetia) **triquetrum**, n. sp. — Cæspitosa, pseudobulbi approximati 2–3 uncias longi, angusti, acute trialati. Folium singulum lanceolatum acutum erectum 3–$3\frac{1}{2}$ uncias longum $\frac{1}{2}$ uncia latum. Bractea vaginata erecta supra folium, lanceolata costata $\frac{1}{2}$ uncia longa. Flores parvi carnosuli 1–2 subsessiles in bractea, nutantes citrino-virides. Sepalum posticum ellipticum lanceolatum obtusum cucullatum, lateralia libera triangularia elliptica obtusissima, apicibus cucullatis marginibus involutis. Petala spathulata. Labellum tenue rhomboideum acutum costis radiantibus obscuris, marginibus tenuiter crenulatis, in medio

discus papillosus aurantiacus. Columna lata brevis, fovea profunda. Capsula ½ uncialis oblonga acute triptera deflexa glabra.

Sogere. Epiphytic, flowers gamboge-green, No. 755.

This curious little Octomeria-like plant is remarkable for the sharp wings on the pseudobulb and fruit.

D. (§ Cadetia) **albiflorum,** n. sp.—Pusilla cæspitosa. Pseudobulbi ½ unciales graciles recti nec incrassati nec alati. Folia ¾ uncia longa, 1 linea lata, linearia lorata biloba dorso carinata. Flores albi minimi, singuli. Bracteæ linearia lanceolata, pedicellis ferme æquales. Sepalum posticum ovatum subacutum, lateralia, subsimilia basi in calcarem conicum obtusum crassum producta, dimidio longitudinis connata. Petala breviora linearia angustissima tenuia. Labellum basi angusto oblongum cuneatum tenue concavum, apice lato reniformi carnosulo flavo. Columna brevis crassa quadrata. Fovea stigmatica profunda. Ovarium papillosum.

Sogere, Nos. 736, 587.

D. longicolle Lindl. Bot. Reg. 1840, Misc. — This remarkable *Dendrobium* was originally described from a plant obtained by Cuming at Singapore and flowered by Loddiges. I am not aware of its having been collected since. In the best specimens the base of the pseudobulb is covered with loose membranous sheaths, and the sepals attain a length of 2 in. and are very slender at the apex. Lindley's plant had pale straw-coloured flowers. Among Forbes' specimens are some similar to the specimen in Lindley's herbarium; in others the petals and sepals are purple. The margins of the lateral lobes of the lips also are purple. The median lobe is lanceolate, with thin deflexed edges, and a thicker yellow-bearded mass in the middle, from which two low lamellæ run to the base of the lip.

Sogere, No. 424.

D. reptans, n. sp. — Rhizoma lignosum diu repens, pseudobulbi angusti elongati conici politi flavi (sicci) ¼–½ uncia dissiti, ¾ uncia longi monophylli. Folia angusta lanceolata obtusa coriacea membranacea uncia longa, 2 lineas lata. Flores parvi tenues singuli in scapis gracilibus tenuibus 1¼ uncias longis, albi. Sepalum posticum lanceolatum angustum, lateralia basi dilatata triangulata acuta obliqua. Petala linearia angusta. Labellum ¼ unciale angustum lineari-oblongum, obscure trilobum, lobi laterales breves angusti lilacino-maculati et marginati, lobus medius porrectus, apice rotundati, ellipticus aurantiacus. Columna brevissima superne aurantiaca, inferne lilacino-maculata.

Sogere, at 1750 feet, No. 531.

A small creeping plant, with numerous narrow pseudobulbs, and solitary delicate flowers. It is allied to *D. funiforme* Bl.

D. Forbesii, n. sp. — Speciosa. Pseudobulbi superne crassi, costati in sicco flavi nitidi. Folia bina patentia crassa coriacea (in sicco) costata, 5 uncias longa, 2 uncias lata, elliptica lanceolata obtusa. Scapi breviusculi circiter 6 unciales racemo florum circiter 10 terminata. Bracteæ majusculæ basis pedicellorum amplectentes, lanceolatæ subacutæ multinerviæ ½ unciales. Pedicelli cum ovariis hispidi præsertim superne, circiter unciales. Ovarium globosum.

Sepala lanceolata acuta glabra. Petala spathulata cordata ½ uncia lata, uncia longa, glabra, splendide ochroleuca. Labellum magnum flavescenti-ochroleucum, venis purpureis ornatum, lobi laterales erecti magni rotundati, lobus medius ¾ uncia latus sinuatus paullo emarginatus cuspide obtuso, margines basales labelli involuti, in medio carina brevis dente valido uncato terminata. Columna crassiuscula, alis latis, clinandrium profundum, fovea ovali-triangularis, alba, marginibus externis purpureis. Capsula globosa hispida.

Mt. Korkoko, No. 634. Also Island of Jobie, *Barclay*, a fruiting specimen.

This most beautiful plant is very nearly allied to *D. macrophylla* Rich., but is distinguished by its larger flowers, described by Mr. Forbes as rich cream-white, with a cream-yellow lip veined with purple, by the glabrous petals and sepals, and the strong-curved tooth at the base of the lips in the centre, arising from a short keel. The edges of the lips at the extreme base are abruptly turned in, so as to make a kind of pouch. What appears to be the same plant in fruit was collected in the Island of Jobie, Geelwink Bay, by Mr. Barclay; and perhaps the plant obtained in N.W. New Guinea, at Galewostrasse, in the voyage of the 'Gazelle,' and referred doubtfully to *D. macrophyllum* by Dr. Kranzlin, is the same species, for the flowers which were not seen by him were described by the collector as yellow. The flowers of the *D. macrophyllum* are usually green, with purple markings. It is much to be hoped that we may soon have this fine plant in cultivation.

Dendrobium (§ *Pedilonum*) *trichostomum* Rchb. f.—Mt. Korkoko, at 3000 ft., Sogere, No. 774; Sogere, at 1700 ft., No. 393, 82. This very handsome plant appears to be common in E. New Guinea. It is nearly allied to *D. Kuhlii*, but the flowers are somewhat larger, and the corners of the lip fimbriate and turned in after the manner of those of *Liparis pectinata* Ridl. The flowers, which are numerous, are described by Mr. Forbes as purple-carmine or rich carnation, with a mauve interior. They are usually borne at the end of the long leafy stems, but in one specimen they are quite low on the base. The leaves have a tendency to become purple, and the mouths of the leaf-sheaths are often edged with violet.

D. (§ Pedilonum) **puniceum,** n. sp.,—Pusilla cæspitosa radicibus longis crebris, pseudobulbis vix ½ uncia longis angustis conicis congestis. Folia lanceolata spathulata obtusa singula, 1½ uncia longa, 2 lineas lata. Racemi brevissimi ½ uncia longi. Flores pulchre coccinei pro planta magni. Sepalum posticum lanceolatum acutum, lateralia elongata triangularia ad basin libera acuta carinata ½ uncia longa, nervo singulo in utro latere carinæ. Petala lanceolata acuta uninervia carinata. Labellum quam petala brevius lanceolata angusta acutissima omnino glabra et integra 5-nervia. Columna aurantiaca brevis marginibus clinandrii profundi lobis duobus brevibus. Anthera compressa.

Mt. Korkoko, at 3000 ft., No. 598. Mt. Wari Wari, at 5000 ft. elevation, No. 425. Flowers blood-red or deep lake-scarlet, with bright orange column.

D. (§ Pedilonum) **cerasinum,** n. sp.—Pseudobulbi breves

unciales cæspitosi haud dilatati. Folia angusta linearia 1½ uncia longa, 1–2 lineas lata, subacuta. Racemi ¼ uncia longi, bracteis pallidis laxis membranaceis ovatis cuspidatis. Flores 3–4 pro planta magni purpureo-coccinei circiter ¼ uncia longi. Sepala et petala lanceolata acuta carinata. Petala angustiora et breviora. Sepala lateralia parum curva basi solummodo connata. Labellum quam sepala brevius anguste loratum lanceolatum acutum læve. Calcar apice dilatato. Columna recta quadrata oblonga elongata versus basin acuminata, linea elevata in ventre. Stigma quadrata. Anthera galeata. Ovarium alatum conicum cum pedicello ½ uncia longa.

Mt. Gawada, No. 517.

This plant and the preceding are closely allied in their habits, being small compact plants, with short pseudobulbs and leaves, and brilliant flowers out of all proportion to the rest of the plant. The latter species is distinguished by its narrower linear bases, distinctly dilated apex of spur, and the purple colour of the rather larger flowers.

Bulbophyllum (§ Elegantes) **kermesinum**, n.sp.—Rhizoma lignosum pinnæ corvi crassitie. Pseudobulbi remoti, uncia dissiti, angusti subcylindrici unciales. Folium singulum erectum spathulatum obtusum coriaceum 3 uncias longum, ¾ uncia latum. Scapus gracilis a pseudobulbo remotiusculus, vaginis 2–4 teretibus membranaceis apiculatis remotis. Flos singulus majusculus patens, bracteas basi ampliata suffultus. Sepala carnosula angusta linearia patentissima, marginibus præsertim ad basin pubescentibus, posticum 3 uncialæ kermesinum, apice nonnunquam splendide aurantiacum, lateralia libera biuncialia purpureo-kermesina. Petala erecta ⅔ uncialia antenniformia basi dilatata. Labellum carnosulum breve unguiculatum, lamina ovata lanceolata acuminata in medio barbata. Columna kermesina maculata crassa curva, dorso rotundato, dentes clinandrii lati truncati bidentati, apicibus acutis pallidi. Alæ columnares curvulæ latæ crassiusculæ marginibus evolutis.

Sogere, 1750–1800 ft., Nos. 433, 775.

B. cornutum, n. sp. — Rhizoma tenue repens, pseudobulbis oblongis monophyllis ⅜ uncia longis dissitis. Folium ellipticum lanceolata tenue carinatum obtusum 1–1½ uncia longum, ¼ uncia latum, cuspidatum. Scapi gracillimi filiformes unciales, vaginis ampliatis acuminatis 2 remotis. Flores solitarii purpurei visi, striati. Sepala omnia libera lanceolata 9-nervia, acuminata, ¼ uncia longa, patentia. Petala breviora, triente longitudinis, angusta linearia lanceolata. Labellum basi incrassatum lobis duabus crassis erectis, inter quos canaliculo, apice cornuto angusto lineari, subobtuso, subtus canaliculato recurvo carnoso. Columnæ dentes duobus erectis acutis. Pes columnæ incrassata lobulis parvis duobus ad basin.

South Cape.

This species resembles at first sight very closely *B. vittatum* Teysm., but differs in its distant not approximate pseudobulbs and the shape of the lip, which is almost terete and upcurved, fleshy, and tapering to the apex like a rhinoceros-horn; at the base it is

broader and slightly flattened, with two short fleshy erect lobes, and a groove between them.

B. paniculatum, n. sp. — Pseudobulbi seriatim approximati oblongi ad basin fibris tecti unciales. Folia linearia obtusissima biloba carinata $3\frac{1}{2}$ uncias longa, $\frac{1}{4}$ uncia lata. Scapus gracilis semipedalis, compressus paniculatus, ramis diffusis laxis, vaginis ad basin brunneis membranaceis semiuncialibus ferme ad basin fissis. Flores minimi violacei inaperti, pedicellis $\frac{1}{4}$ uncialibus cum ovariis flavis. Bracteæ lanceolatæ setaceæ parvæ. Sepala ovata obtusa, bullata, petala angustiora breviora omnia violacea, linea mediana obscurioræ. Labellum ungue erecto curvo, angusto, canaliculato, costa mediana, lamina dilatata subreniformi obtuse cuspidata, bullata. Columna crassa ferme recta pede brevi. Clinandrium vix profundum marginatum, dentes latæ subbifidæ, breves. Anthera compressa incomplete 4-loculata. Stigma ovali triangulare profundum. Pollinia ovata 4. Ovarium globosum flavum bullatum.

Sogere, 1800 ft., Nos. 392, 573.

This is a very curious-looking plant, in some respects nearly akin to Blume's *Cochlia violacea*, as far as can be judged from his meagre description and his figure of the flower. That species, however, is said to have a capitate inflorescence. The scape is freely branched, having numerous distant slender branches, bearing the very small globose flowers. The sepals and lip are covered with warts or bullæ ; the teeth of the column are short, blunt, and almost bifid.

Bulbophyllum grandiflorum Bl. and *B. Gerlandianum* Kranzl. are also recorded from New Guinea.

Eria foliosa.—*Dendrobium foliosum* D'Urv. Voyage de la Coquille, p. 203, Plate xli.—This plant, which does not appear to have been obtained since the expedition of the 'Coquille,' under Duperrey, has been found by Mr. Forbes in New Guinea, at Gawada, No. 867. It was originally found in Amboina. The New Guinea specimens correspond very closely to the figure above quoted; but the lip is finely pubescent towards the apex, and there is a low keel running from the base of the lip in the median line. The whole plant dries black, as do others of the same section.

Eria puberula, n. sp.—Caulis pseudobulbosus 3 uncias longus. Folia 3 uncias longa, $\frac{1}{4}$ uncia lata lanceolata acuminata acuta basi angustata. Racemi plures $2\frac{1}{2}$ unciales, basibus vaginis ampliatis tectis, rachide puberulo. Flores parvi plures patuli. Bracteæ lanceolatæ membranaceæ deflexæ 3 lineas longæ. Pedicelli 2 lineas longi pubescentes. Sepalum posticum lanceolatum loratum parce pubescens, lateralia triangulari, lanceolata oblique. Petala lanceolata obtuso-tenuiora glabra. Labellum obcuneatum trilobum, basi angustatum, lobi laterales anguste lineares falcati, obtusi, medius major obtusissimus ellipticus oblongus. Columna erecta parum curva, ventre carinata præsertim ad basin. Stigma profundum prominens. Alæ clinandrii parvæ.

South Cape.

Phreatia albiflora, n. sp. — Pusilla cæspitosa, breviter caulescens. Folia coriacea lanceolata spathulata obtusa carinata 4 uncias

longa, $\frac{1}{3}$ lata. Scapi e vaginis inferioribus orientes $2\frac{1}{2}$ uncias longi graciles, vaginis remotis ampliatis paucis. Racemus laxus; flores minimi albi. Bracteæ lanceolatæ acuminatæ membranaceæ linea longæ ovario cum pedicello æquantes. Sepala ovata triangulata, lateralia latissima. Petala breviora angustiora. Labellum parvum vix petalo æquale concavum, cuneatum obtusum.

Mt. Korkoko, No. 675.

Phreatia papuana, n. sp.—Pusilla, caulescens. Folia coriacea, lanceolata biloba vaginis latis striatis, 2 uncias longa, 2 lineas lata. Scapi ex axillis orientes 2–3 graciles ferme omnino racemosi $1\frac{1}{2}$–$1\frac{3}{4}$ uncias longi vaginis amplis. Flores minuti resupinati copiosi albi. Bracteæ lanceolatæ acutæ pedicellis æquales. Sepala ovata, lateralia cum labello calcar formantia. Petala lanceolata obtusa. Labellum angustum lineari-lanceolatum subobtusum.

Sogere.

(To be continued.)

OF THE FLORA OF CEYLON, ESPECIALLY AS AFFECTED BY CLIMATE.

By Henry Trimen, M.B., F.L.S.

(Concluded from p. 305.)

A few portions of original forest still remain in the tracts of country between Ratnapura and Galle, of which that known as the Singhe-Rajah is the most extensive. Here the true native flora of this part of Ceylon can be still seen unaltered, and it is of remarkable interest, as will be immediately shown. The agent of destruction of the forests here has been the indolent and improvident practice of native cultivation known as "chena," a practice which has prevailed and been continued from a remote antiquity, and by which, for the sake of a single crop of some miserable grain, such as Kurakkan (*Eleusine Coracana*), the forest-growth of centuries is sacrificed. The inevitable result of this reckless system has been at last reached in not a few districts of this naturally fertile tract, and there are now many wide expanses of arid stony land absolutely worthless and covered by nothing but a dense sheet of that extraordinary weed from the New World, *Lantana mirta*, which seems to require nothing but a sufficiently warm and moist climate to flourish. I have not been able to ascertain the precise date of the introduction of this plant into the island, but it was probably between 1820 and 1830. It is not included in Moon's Catalogue of 1824. It was no doubt imported as an ornamental garden-shrub, and, as in other parts of the Eastern Tropics, quickly established itself as an overpowering weed of open ground. Its range in Ceylon is, however, limited strictly by climate; it does not extend out of the wet region, nor above some 3500 ft. elevation; within these limits it is, without doubt, the most abundant plant. Much of similar lost land supports a dense covering for miles of a small native bamboo, the

"Bata-li" of the Singhalese (*Ochlandra stridula*), a favourite food of the elephant.

In the recesses of the Singhe-rajah and other wet low-country forests the trees are very high and closely placed, and no sunlight penetrates; much of the ground is covered with water, and there is a remarkable stillness and absence of animal life. The trees belong principally to the families of *Dipterocarpeæ*, *Rubiaceæ*, *Sapotaceæ*, *Ebenaceæ*, and *Euphorbiaceæ*, and to the genera *Semecarpus*, *Memecylon*, *Eugenia*, and *Ficus*; their wet trunks are covered with ferns, mosses, and orchids, and wreathed with climbers, such as *Freycinetia* and species of *Calamus*, and with climbing ferns, as *Lindsæa repens*, *Stenochlæna palustre*, and the Lycopodiums; while the fronds of the great *Ophioglossum pendulum* hang down like yards of green satin ribbon. Two interesting and peculiar slender tree-ferns grow in these hot steamy forests, *Cyathea Hookeri* and *C. sinuata*; and the most admired of Ceylon orchids, *Dendrobium Maccarthiæ*, ornaments the trees in May with its lovely flowers in a few places. On the ground flourish many ferns, and beautiful shade- and damp-loving herbaceous perennials, members of the families *Zingiberaceæ*, *Gesneraceæ*, *Rubiaceæ*, *Orchideæ*, &c., and of the curious Dilleniaceous genus *Acrotrema*, the primroses of these Ceylon forests. Among the timber-trees the most valuable is the Calamander, a word corrupted from the Sinhalese name, "Kalu-médiriya" (*Diospyros quæsita*), a sort of mottled or streaked ebony much sought after for furniture and cabinet-work; and the Nédun (*Pericopsis Mooniana*), more largely used for the same purposes. Both these trees are peculiar to Ceylon.

Native vegetation has also been curiously preserved in a few places which "chena" cultivation has been unable to reach, namely, on the precipitous summits of certain of the small isolated gneiss, rocks, or hills scattered over the south part of the district, such as Hiniduma (or Haycock) and Nillowe Hills. The space on the tops of these rocks is very small and steep, but here, crowded together, are a number of remarkable species mostly peculiar to Ceylon, and in several cases now entirely restricted to the few square yards in question on those isolated spots.

And this leads me to mention one of the most remarkable features of the Ceylon flora, *viz.*, the very large number of species which are peculiar to the island, or, as botanists call it, *endemic*. About 800 species (nearly 30 per cent.) of the whole number found here are, so far as is known, found nowhere else in the world. This is, considering the geographical position of Ceylon in relation to India, a really extraordinary fact, and leads to some interesting speculations as to the origin of our flora, which I have to some extent followed out elsewhere.* I now mention it in this place, because the most distinct and well marked of these endemic plants are almost entirely concentrated in this wet south-west region, which is thus seen to be as peculiar in its flora as in its climatic character. The tree vegetation of the forests above mentioned is almost wholly

* Journal of R. Asiatic Soc. (Ceylon Branch), vol. ix., pp. 139–159.

composed of endemic species, and not a few endemic genera. And it is another remarkable and significant fact, with regard to these, that their affinities and near alliances are with the plants of the Malay Islands and Peninsula far more than with the flora of Southern India. This is especially seen in the abundance of species in this part of Ceylon of the family *Dipterocarpeæ*, which is remarkably characteristic of the Malayan flora. But I am not in this paper dealing with the geographical affinities of Ceylon vegetation.

The low moist region under consideration may well include the lower hills of the central mountain mass up to about 3000 ft. Above that elevation there is very little paddy cultivation, nor any Coco-nut or Areca Palms. The characteristic flora of the hills themselves scarcely commences below 5000 ft., and we have thus an intermediate belt of from 3000–5000 ft. of a transitional character. Before the English occupation of the Kandyan Kingdom in 1815 it is probable that the whole of this zone was, like all above it, in a completely natural state, uncultivated and uninhabited; indeed it was not until some years after that event that the pioneers of coffee-cultivation in plantations made the first gaps in the then unbroken sheet of primeval montane forest. How rapidly and to what an extreme extent this clearance of forest went on is very well known; in an incredibly few years hundreds of square miles of trackless forest-clad hills became transformed into open coffee-estates, roads were made, houses built, and a numerous population of Europeans and Indian coolies brought together. From this development of British enterprise it was especially the belt of forest from 3000–5000 ft. that suffered; even the crests of the hills within its limits were not spared, but all cleared, and at the present time very little forest exists, the only remaining patches having been preserved either from occupying very precipitous slopes or from being the property of one of the Buddhist religious corporations, and thus unavailable for sale. One result of this clearance has been to cause the floras of the low country and the true mountain districts above 5000 ft. to appear more sharply defined than was naturally and originally the case. In reality the transition is doubtless gradual; but there is now no part where this can be well traced, save perhaps on the S.W. slopes of Adam's Peak, where on the lower hills there still remain some rather more extensive forest-tracts. On the Coffee-estates—now rapidly becoming Tea and Cinchona estates—scarcely any native vegetation remains; an army of cosmopolitan exotic weeds of warm countries has taken its place; of these the most conspicuous are annual *Compositæ*, some of which occur in vast abundance, as the White-weed (*Ageratum conyzoides*), the Spanish Needle (*Bidens composita*), *Gnaphalium indicum*, and *Erigeron linifolius*. The few remaining strips of forest show a very great variety of species; characteristic trees are the Dums (*Doona zeylanica*, *D. Gardneri*, &c.), members of a genus of *Dipterocarpeæ* peculiar to Ceylon. These have tall stems and umbrella-like heads of foliage, their appearance strongly recalling the artistic Stone-Pine of Italy. Many species of Balsam (*Impatiens*) are found here, and other damp-loving plants;

it *was* the great region for epiphytic Orchids, and is still the special district inhabited by a splendid epiphytic creeper, *Kendrickia*, which covers the trees with masses of large rosy flowers; whilst among the dead leaves beneath glow the great Gloxinia-like flowers of the root-parasites, *Christisonia*.

But we must pass on to examine the true HILL-REGION, that is, the montane zone above 5000 ft. The selection of this particular height is of course quite arbitrary, but it fairly well marks the lower limit of our specially montane plants; and it is practically convenient, as it has been fixed as the elevation above which no forest-land is now sold by Government.

With the exception of certain grassy tracts, to be presently noticed, all the hills (the highest of which attains to nearly 8400 ft.) are forest-clad over their summits. The climate is generally very wet, and the forest has special characteristics. All the trees are evergreen, for the most part rather small, hard-wooded and of very slow growth; they stand close together, and form a very dark jungle; their leaves are in very large proportion small, rounded, smooth, thick, and leathery. The number of species is very large, and some genera are represented by many species, as *Eugenia*, *Calophyllum*, *Litsea*, *Actinodaphne*, *Gordonia*, *Elæocarpus*, *Symplocos*, &c. The dense undergrowth is very largely made of gregarious plants, known by the Sinhalese under the name of "Nilu." These are species of the genus *Strobilanthes*, and most of them have the peculiarity of requiring several (five, six, or seven) years to arrive at the flowering and seeding period, after which they die down. Towards the end of their growth-period their innumerable close straight stems, 6–10 ft. high, form an almost impenetrable growth. Several species of dwarf or semi-scandent Bamboos also occur in similar situations, and are equally obstructive to progress. The tree-trunks are always damp and often trickling with water, great ragged masses of *Usnea* and *Meteorium* hang in picturesque disorder from the branches, whilst the bark is the home of many Filmy-Ferns, Hepatics, and Orchids. Most of the epiphytic Orchids are peculiar to Ceylon; they are many, but few bear flowers of any size or of striking beauty. Ceylon indeed is rich in number of Orchids (over 150, or 5 per cent. of the whole flora), but they play but a small part in the general aspect of vegetation. Ferns are also abundant in these hill-forests; and the endemic *Alsophila crinita*, certainly the handsomest tree-fern of the East, is very common, its stems attaining 20 or 25 ft. in height, or even more in favourable situations. Fine specimens of this have been successfully introduced into England this year for the first time.

But the charm of the hill-country to the English botanist lies in the links with home supplied by the smaller flowers. These frequently belong to familiar English genera, and such ones as Buttercups, Anemones, Violets, Blackberries, Cinquefoil, Calamint, Teazle, and Whortleberries, gladden the eyes, and seem to awake a strange sympathy. It must be distinctly understood that in Ceylon there is nothing in any way approaching an *Alpine* flora; these temperate European types are the nearest approach to it, and they

are here mingled with many mountain plants of the East which do not occur in Western Temperate Regions, as species of *Osbeckia*, *Sonerila*, *Hedyotis*, *Exacum*, and *Strobilanthes*.

In distinction from the low-country vegetation, this hill-flora shows no special affinity with Malaya, whilst it is really very closely allied to that of the Nilgiri Mountains of S. India; though this affinity is shown in a highly remarkable and instructive manner. Less than 400 miles separates the summits of Pidurutalága, the highest mountain in Ceylon, and Dodabetta in the Nilgiris (and there are half-way houses in the Pulnis and Anamalais). Yet the curious fact presents itself that more than half the *species* of the Ceylon hills are not found in the Nilgiris or other hills of the Indian Peninsula, but are endemic there, and probably an even larger proportion of Nilgiri species do not extend to Ceylon. The number common to both ranges is only about 200. Yet very nearly all belong to the same *genera*, which are almost identical for both regions. It is thus possible to make the contradictory assertions that the floras are very similar and very different.

Let us take some illustrative examples. Of the genus *Strobilanthes*, consisting of the "Nilus" just mentioned, the Ceylon hills possess twenty-two peculiar species, and the Nilgiris, &c., about twenty-nine, whilst only two are found in both regions; of the mountain species of *Impatiens*, there are also two common to both ranges, whilst Ceylon has ten others endemic, and the Nilgiris thirty; and other examples could be easily given. If we suppose a common origin for both these hill-floras in the past, or derive the one from the other, the differences now seen in the two districts indicate a sufficient lapse of time since their separation to allow of the evolution under different surroundings of new forms of the rank of species, but not of the superior rank of genera. In the case in question the energy with which this differentiation of specific forms has gone on is highly remarkable.

One cannot take leave of the mountains of Ceylon without a few words about the *patanas*. These are open grassy spaces, often of large extent, lying between the masses of forest; they have the character of open downs, and are similar to the "savannahs" of the Western Tropics. The patanas are not confined to the highest regions, being found as low as 2000 ft.; but they are most characteristically developed in the true montane region, and especially on the eastern or drier side, in what is known as the Province of Uva. The vegetation consists mainly of large coarse grasses, belonging to the genera *Andropogon*, *Anthistiria*, *Pollinia*, *Garnotia*, and *Arundinella* growing in a tufted or tussocky manner, which makes riding and walking dangerous and fatiguing; in their proper seasons, however, a multitude of delicate and beautiful flowers spring up and blossom with the tall grass. Among these are numerous terrestrial Orchids,—of which the beautiful Daffodil Orchid (*Pachystoma speciosum*) with its large nodding yellow flowers is very conspicuous,—Blue-bells (*Wahlenbergia*), Everlastings (*Helichrysum* and *Anaphalis*) and Gentians (*Gentiana quadrifaria*, *Swertia zeylanica*), and the splendid purple *Exacum macranthum*. There are

also many low shrubby *Leguminosæ*, *Rubiaceæ*, and *Melastomaceæ* with showy flowers, but the patanas are almost absolutely devoid of trees. In the high patanas almost the only tree is the common Rhododendron (*R. arboreum*), whose numerous trusses of crimson flowers light up the hill-sides; whilst at the lower elevations the patana trees are principally *Careya arborea* (rather inaptly called the "Patana Oak") and the Nelli (*Phyllanthos Emblica*).

A curious phenomenon, which strikes every traveller in the mountains, is the very abrupt line of demarcation between the patana and the forest; so sharply defined is this that it is hard to persuade oneself that Nature alone has had a hand in it. The explanation appears to be that in the course of vast ages a perfect equilibrium between the two floras has been arrived at, so that now neither can encroach on the other: the patana plants are unable to exist in the dense shady forest, whilst the seeds of the forest-trees never get a chance even of germination in the closely occupied grass-land. So far as can be observed, this balance is now maintained without change.

The Dry Country. — We have now briefly considered the botanical characteristics of the parts of Ceylon possessing a moist, rainy climate; it remains to make a few remarks on the large tracts of country lying to the north and east, where, as already mentioned, the rainfall is both less in whole annual amount and more or less restricted to a definite period of the year. In the driest places—as, for instance, Manaar in the N.W. and Hambantota in the S.E.—it is almost absolutely rainless for by far the greater part of the year, though the average *annual* rainfall of these localities is thirty-three and thirty-eight inches respectively. But the whole of this falls in the course of a month or two in the middle of the north-east monsoon, and thus affects but little the generally maintained drought. What is so marked in these cases is true in a less degree over all this great tract of country; in no part does the annual rainfall exceed sixty inches, but in the central parts it is somewhat better distributed, a certain amount of benefit being obtained from the south-west monsoon. The country generally is very flat, a few domes or masses of gneiss rock standing up out of the forest alone breaking its level monotony. The forest, which covers the whole country, has all the appearance of having existed from the earliest times untouched. But it would appear that this can scarcely be the case. It is impossible wholly to disregard the Singhalese records—backed up as they are by the widely scattered and stupendous ruins of cities, temples, aqueducts and tanks—that in the days when the seat of government was in various parts of the north or centre of Ceylon, these parts were thickly inhabited and extensively cultivated. It is said that this now dry and unproductive region was once so rich as to be termed "the granary of India"; this would be, I suppose, in the first few centuries of the Christian era, to which period so many of the great ruins of religious edifices and irrigation works are to be referred. Making every allowance for Oriental exaggeration, we must, I think, give some credit to these traditions. Modern experience shows us that

given only water continuously, the soil is capable of great things; it is I think, in many parts, more productive than in the parts of the island more favoured by rainfall. If then the great tanks, sluices and anicuts, whose magnitude and skilful construction still fill us with wonder, were ever in good working order, an immense amount of land may have been under cultivation and very fertile. But beyond the ruins of these vast works we cannot now trace any evidence of a large population; unbroken forest covers everything. The question is of great interest, for if the country were really occupied by a numerous and industrious people engaged in paddy cultivation, we have to believe that the comparatively short space of 1000 years, or even less, has been sufficient to completely restore an aboriginal forest vegetation over a large tract of country. I believe that similar problems present themselves in several parts of India. But the explanation may perhaps be found in the consideration that in Ceylon probably no great extent was cleared and cultivated at any one time or for any long period. It is well known, from the native records of the island, that the population was being constantly driven from one district to another by the frequent invasions from S. India, and thus their fields would be abandoned after comparatively short periods of culture. At that time, too, it must be remembered, as helping to account for a more rapid return of natural forest vegetation, that there had been no importation of the exotic tropical weeds, which now so rapidly occupy open ground, and give little chance to the natives to resume their position. A remarkable fact to be noted is, that this dry Ceylon forest is all evergreen, and is thus different from most similar tracts in Southern India. It is true that some of our Ceylon *species* are deciduous, but they are so for a very short period, and are not as a rule trees which form any large part of the forest vegetation. Thus we have nothing like a deciduous forest as a whole.

Perhaps the most striking feature of this great dry forest-region is its monotony. This does not result from poverty of species; on the contrary they are numerous, but the resulting vegetation as a whole is very uniform over many miles of country. The trees are not as a rule very large, but this is to be partly accounted for by all the best timber trees having been cut out—for here, as in other parts of the colony, Government has played fast and loose with its land and what stands on it, and lived on capital instead of interest. Some of the largest species are also those of most value as timber, such as the Satin-wood (*Chloroxylon Swietenia*), the "Halmilla," or Trincomalie wood (*Berrya Ammonilla*), and the "Pau" (*Mimusops hexandra*). Ebony (*Diospyros Ebenum*) is also a common tree, but does not attain so large a size. Other characteristic trees are "Wira" (*Hemicyclia sepiaria*), which is perhaps the most generally prevailing tree over large tracts; Walmora (*Gleniea zeylanica*), Wewerane (*Persea semecarpifolia*), Kohomba (*Azadirachta indica*), Goda Kirilla (*Holoptelea integrifolia*) the Indian Elm, Mi (*Bassia longifolia*), Ehéla (*Cassia Fistula*), and very many more. The undergrowth is usually dense, consisting of

shrubby species of *Aurantiaceæ* and of the genera *Memecylon* (very characteristic of all parts of Ceylon), *Bauhinia*, *Phyllanthus*, *Croton*, *Maba*, *Ixora*, &c. Climbers are comparatively few, species of *Derris*, *Ventilago*, *Jasminum*, and *Vitis* being most characteristic. Bamboos are almost absent, and Palms quite so. Except after the heavy rains there are very few herbaceous plants to be seen, and the absence of flowers of any size or bright colouring adds to the general sombre character of the forest. The flower-gardens of this district are the surfaces and margins of the tanks, which have a beautiful aquatic flora of their own. The general drought almost forbids the growth of ferns, and beyond some half-dozen of the hardiest kinds, there are none; the smaller damp-loving Orchids are also absent, but to make up, several of the larger and more handsome ones are found on the trees, as *Vanda Roxburghii*, *V. spathulata* and *Saccolabium guttatum*.

Time does not admit of further details. Towards the coast the soil becomes more sandy and the higher forest disappears, a scrubby semi-littoral vegetation taking its place. Stunted thorny thickets of "Andara" (*Dicrostachys cinerea*), and species of *Acacia*, *Carissa*, *Zizyphus*, *Gmelina*, *Azara*, &c., cover the country, and are ornamented with climbing species of *Ipomæa*, *Asparagus*, *Asclepiadeæ*, *Cucurbitaceæ*, and vines. This vegetation passes into the truly seashore flora.

The plants of all this dry district of Ceylon are essentially those of the Carnatic and Coromandel coast of the opposite Indian continent. Nearly all of the species are identical, and there is a much greater similarity between the two countries than between the two climatic districts of Ceylon itself. So far as the flora is concerned, one would think the separation of Ceylon from the mainland (now parted by the very shallow Palk's Strait) to be geologically recent; even the few endemic species in this part of Ceylon are all closely related to the continental ones, and clearly derivable from them or from common ancestors. And the Malayan element, so prevalent in the low country of South-west Ceylon, is here conspicuously and almost entirely absent.

I might continue this sketch of Ceylon botany further, and give some account of the flora of the river-banks and the great ruined tanks, of the seashore, the coco-nut groves, and the mangrove swamps, but there is little of special significance in these aspects of vegetation as concerning Ceylon. The floras of tropical seashores are remarkably similar everywhere; doubtless many seeds are imported directly by the waves and currents, and possibly this may have been the case in Ceylon with the coco-nut itself, the original home of which noble palm still remains one of the unsolved problems of geographical botany.

In concluding this paper, I wish to add a few words about the Botanical Department maintained by the Colonial Government. It may, I think, be truly said, that no other British colony possesses so complete a system of botanical and experimental gardens as Ceylon; and I may now add that their sites have been determined on the principle that each of the climatic districts which I have passed in review should be represented.

The central establishment consists of the well-known Botanic Gardens at Peradeniya, a place about four miles to the south of Kandy, the capital of the Central Province. The elevation of these gardens averages about 1540 ft., so that it lies in the higher part of the wet low country of the south-west district. The climate is thus moist and very equable, the average annual temperature being about 77° F., and the average rainfall about 85 inches, which fall on some 200 days of the year. Such a climate suits very well all the plants of the wet tropical regions of the globe, with the exception of some of the purely equatorial species, for which our nights are found to be too cool. To provide, however, for this interesting class of plants, we possess a small garden at the village of Heneratgoda, a place nearly at sea-level and about twelve miles inland from Colombo. The mean annual temperature is here several degrees higher than at Peradeniya, the rainfall beng much the same. In these gardens, of course, no truly temperate plants can be satisfactorily cultivated, but for the growth of these a third garden exists in the mountains, at an elevation of 5800 ft., at the foot of a rocky mass known as Hakgala. This garden is surrounded with primeval hill-forest; in it can be successfully grown most of the plants of warm temperate climates, with the exception of those which are intolerant of much rain and cloud. The plants of *dry* temperate climates do not succeed well anywhere in Ceylon; but for dry tropical species an experimental garden has been established at Anuradhapura, the ancient capital, in the dry northern part of the island. Many of the plants of peninsular India, which do badly at Peradeniya and Heneratgoda, here find a suitable climate. A fifth garden has quite recently been established at Badulla, the capital of the province of Uva, in the east of the island, at an elevation of some 2000 ft. Here the climate is considerably drier than on the western side of the mountains as already described.

It is thus evident that the Ceylon Government has very fully recognized the advantage to the colony (a purely agricultural one) of an organized botanical department on a large scale, as an aid towards the material prosperity of the country. The aspect, however, in which I wish to present this before you here, is that it affords great facilities for the prosecution of botanical research, and to express my earnest hope that these facilities will be more freely availed of by English students, to whom every assistance that I, as director of the gardens in Ceylon, can afford will be gladly given.

NEW CAPE *LILIACEÆ*.

By J. G. Baker, F.R.S.

On going through the recently-discovered Masson drawings at the British Museum,* I noted among them the following undescribed species of *Liliaceæ*:—

* See Journ. Bot. 1885, 227 (footnote).

Massonia latebrosa Masson MSS.—Bulb not seen. Leaves oblong or obovate, erecto-patent, 2–2½ in. long, 1–1¼ in. broad, acute, scabrous, and streaked vertically with purple. Capitulum sessile, under an inch in diam. Flowers white; bract lanceolate; tube cylindrical, ⅓–½ in. long, ⅛ in. diam. at the throat; segments lanceolate, reflexing, ⅙ in. long. Stamens erect, ¼ in. long, connate in a ring at the base.

Hab. Bokefeld, Aug. 1792, *Masson*.

M. læta Masson MSS. — Bulb not seen. Leaves ovate, subobtuse, glabrous, spreading, 3–4 in. long, 2 in. broad, distinctly distantly ribbed vertically. Capitulum dense, sessile, about 1 in. in diam. Flowers white; bracts ovate; tube infundibuliform, ⅓ in. long; segments very short, lanceolate, reflexing. Stamens short, erect, ⅓ in. long.

Hab. Summit of the Kamisberg, *Masson*. Drawing made in the year 1794.

Lachenalia undulata Masson MSS. — Bulb not seen. Leaves 2, oblong, obtuse, suberect, much crisped towards the margin, glabrous, 3–4 in. long, 1 in. broad. Peduncle green, 4 in. long. Flowers in a lax spike 3 in. long; outer segments tinged with green, ¼ in. long; inner white, tinged with claret-purple, about ⅓ in. long. Stamens as long as outer segments.

Hab. South-western district, *Masson*.

L. Massoni Baker. — Bulb ovoid, ¾ in. diam. Leaf single, suberect, clasping the stem at the base, above flat, orbicular, 1½ in. long and broad, covered over the surface with white bristly hairs. Peduncle purple, 4 in. long. Raceme lax, 2 in. long; lower pedicels ⅛–⅙ in.; bracts minute, ovate. Perianth with purple-tinted outer segments ½ in. long; inner white, ⅙ in. longer. Stamens as long as the outer segments.—*L. hirta* Masson MSS., non Thunb.

Hab. Namaqua-land, *Masson*, Aug. 1793.

L. succulenta Masson MSS. — Bulb ½ in. diam. Leaves lanceolate, purple-tinted, 4–5 in. long, ⅓ in. broad. Peduncle slender, purple, as long as the leaves. Raceme lax, 2 in. long: lower flowers spreading; pedicels erecto-patent; lower ⅙ in. long; bracts small, deltoid. Perianth claret-white, ½ in. long; outer segments ⅛–⅙ in. longer than the inner. Stamens included.

Hab. Olifants River, *Masson*. Drawing made in the year 1793.

Albuca Massoni Baker. — Bulb small. Leaves 6–7, terete, glabrous, ½ ft. long, under a line in diam. Peduncle slender, terete, about as long as the leaves. Raceme rhomboid, 10–12-flowered, about 2 in. long and broad; pedicels erecto-patent; lower an inch long; bracts lanceolate, lower ⅓ in. long. Perianth greenish, ½ in. long; inner segments rather shorter than the outer.

Hab. Olifants River, *Masson*. The drawing has no dissections, so that the character of the stamens is not shown.

NOTES ON PONDWEEDS.

By Alfred Fryer.

1. Potamogeton natans L. — Leaves *all floating*, long-stalked, *coriaceous;* upper *jointed* to the petiole, rotundate-elliptical to lanceolate, auricled at the base, *persistent;* lower *narrowly linear*, rarely spathulate, or lanceolate, *lamina deciduous;* stipules very long, scarious, acuminate; drupelets, fresh, rounded on the back, rarely with indications of a keel; dried, keel acute, lateral ridges faint; beak short, prominent, slightly recurved: stems simple below, rarely branched in the upper floating part.

Perhaps the character by which *P. natans* may be most readily separated from the other British species lies in the *joint* between the petiole and the lamina of the upper persistent leaves. This joint, as my friend Mr. W. H. Beeby has ably pointed out, is formed by the lamina not extending to the base of the midrib, the lower part of which forms a flexuous joint of the same colour and texture as the midrib itself:—"Lamina not extending to the base of the midrib, which is bare for its lower ½ in. Bare portion of the same colour as that of the upper part, and so distinguished from the midrib proper."—W. H. Beeby *in litt.*, May 5th, 1886. Prof. Babington is, I believe, the only author who has clearly noticed this jointed character of the upper leaves:—"*Jointed to the stalks a little below the limb.*"—Bab. Manual, ed. vii., p. 371. A second, but less easily observed, point of difference is that all the leaves, lower as well as upper, are ultimately floating—none being permanently submerged, as is the case in all our other British forms.

The lower leaves are narrowly linear, with very long petioles, which the lamina seldom exceeds in breadth, being usually reduced to a slightly thickened midrib. This extremely simple form of leaf gradually passes into leaves slightly expanded at the end, or spathulate, and showing indications of a nerve on each side of the central one; and these again pass into leaves with a short, narrowly lanceolate lamina. When this more perfect stage of leaf-form is reached it is sometimes difficult to distinguish these lower deciduous leaves from the narrower forms of the upper permanent leaves, except by the absence of the joint so characteristic of the latter. As far as I have observed, too, the lower leaves are never involute in a young state, the upper always are.

As it is the habit of this species to grow in dense masses which nearly cover the surface of the water, and as young branches are freely produced throughout the summer from the rapidly increasing stolons, it is evident that the lower first-formed leaves on these young shoots are better enabled by their slender grass-like form to penetrate any slight chinks in the dense growth above. When they reach the surface of the water they get more light and warmth, and so add to the strength of their parent shoot, soon enabling it to produce the broad permanent leaves which reach the surface in the form of a closely-involute scroll. This young rolled-up leaf then emerges from the water into the open air, where it soon expands

in the sunshine, and sinks back on the surface of the water; here the flexuous joint enables it to occupy any vacant space, and throughout the whole period of its growth to twist itself as much as possible out of the way of its fellow leaves. On the other hand, the unjointed lower leaves, having performed their office in the economy of the plant, are soon smothered by their more adaptable neighbours.

It is a curious but not very easily explained fact that a great part—not the whole length—of each of the petioles of these lower leaves is sub-persistent. But this peculiarity cannot be certainly relied upon as characteristic of the species, since it is shared by one form of *P. polygonifolius*; see Mr. A. Bennett's valuable note in 'Exchange Club Report for 1884,' p. 112. These sub-persistent petioles have led to *P. natans* being described as having submerged lower leaves; in the proper sense of the term it has none: all its leaves are submerged when immature, none when fully developed.

All the various forms of leaves may be noticed from March to November, as they are produced throughout the whole season of growth. Early in the year, before the broad upper leaves are to be seen, and while the immature linear leaves have not yet reached the surface of the water, the plant certainly seems to have submerged leaves; but if these are carefully watched, they will be seen to rise to the surface, and float there until the lamina decays.

As this species freely ripens its seed, it seldom produces *hybernacula* or winter buds; these are rarely noticeable, but, when present, are composed of a flattened cluster of linear leaves, each with a stipule at its base, forming a thick tuft laterally compressed, and growing from the axil of one of the upper leaves. When the parent branch decays at the approach of winter, this hybernaculum drops off and floats about until roots are emitted, when it sinks to the bottom of the water and becomes firmly rooted in the soil.

In these desultory notes on such of our British Pondweeds as I have been able to observe in a living state, I make no attempt at giving full specific descriptions, but merely endeavour to add a little to the life-history of a genus in which, from many of the forms seldom perfecting seed, habit and modes of growth are of unusual specific importance. With a view to the correction of any errors I may have fallen into from the extremely local nature of my researches, I shall be glad to correspond, or exchange specimens with any fellow student, especially remembering that it is only by the aid of many observers in widely separated localities that we can hope to arrive at a sound knowledge of this difficult genus. Letters may be addressed to me at Chatteris, Cambridgeshire.

NOTES ON SOME NORTH WALES PLANTS.

By Rev. W. Moyle Rogers, F.L.S.

These notes are the fruit of a month's botanizing (Aug. 7 to Sept. 3) in N. Wales this year. They leave all but untouched the characteristic plants of the Welsh highlands, as I reached the top

of only one of the higher hills,—Manod Mawr (2178 ft. above sea-level). None of the rest of the ground examined by me was higher than Watson's Mid-agrarian zone, which reaches 900 ft. As a S.W. England botanist, visiting Wales for the first time, I was especially interested in comparing the flora of the lower upland districts with that of Devon and Cornwall, so remarkably similar to it in most respects. My time was divided equally between the counties of Denbigh and Merioneth,—my first fortnight being spent in the Vale of Llangollen in Denbighshire, and my second partly at Dolgelly and partly at Blaenau Festiniog in Merionethshire. From Festiniog I also twice crossed into Carnarvonshire, getting about two hours' botanizing each time, that in the neighbourhood of Roman Bridge railway-station being especially good.

The following is my list of "New County Records." The nomenclature is that of Lon. Cat. ed. 8. Exact *localities* for each "new" species will be given in the succeeding notes, where will also be found some account of the distribution of the *Rosa canina* forms and other segregates not noticed in 'Topographical Botany.'

For Denbighshire—

Cardamine flexuosa.
Polygala serpyllacea.
Lychnis alba.
Sagina apetala.
Trifolium dubium.
S. nodosa.
Prunus insititia.
Rubus rhamnifolius.
R. echinatus.
R. Radula.
R. fusco-ater.
Rubus corylifolius.
Pyrus torminalis.
Callitriche stagnalis.
Epilobium roseum.
Sium erectum.
Hieracium vulgatum.
Betula alba.
Quercus pedunculata.
Salix cinerea.
Glyceria aquatica.
Lastræa dilatata.

For Merionethshire—

Ranunculus hederaceus.
Nuphar (?) luteum.
Sisymbrium Thaliana.
Viola Reichenbachiana.
V. lactea.
Polygala serpyllacea.
Cerastium semidecandrum.
Arenaria serpyllifolia.
A. leptoclados.
Sagina apetala.
Malva moschata.
Tilia cordata.
Rhamnus Frangula.
Prunus insititia.
P. avium.
Rubus plicatus.
R. (?) nitidus.
Rubus rhamnifolius.
R. leucostachys.
Rosa arvensis.
Callitriche stagnalis.
Epilobium palustre.
Scandix Pecten-Veneris.
Æthusa Cynapium.
Silaus pratensis.
Viburnum Opulus.
Asperula odorata.
Scabiosa arvensis.
Filago minima.
Hieracium vulgatum.
H. boreale.
Hypochæris glabra.
Leontodon hirtus.
Anagallis tenella.

Menyanthes trifoliata.
Myosotis cæspitosa.
Echium vulgare.
Mentha hirsuta.
Lamium Galeobdolon.
Polygonum lapathifolium.
Betula alba.
B. glutinosa.
Salix cinerea.
S. aurita.
S. caprea.
Juncus glaucus.
Luzula multiflora.
Typha latifolia.
Scirpus setaceus.
Carex remota.
C. ovalis.
Carex Goodenowii.
C. pallescens.
Holcus mollis.
Phragmites communis.
Melica uniflora.
Aira caryophyllea.
A. præcox.
Glyceria plicata.
Festuca sciuroides.
Bromus sterilis.
Brachypodium sylvaticum.
Agropyron junceum.
Lastræa Oreopteris.
L. dilatata.
Equisetum arvense.
L. limosum.

For Carnarvonshire—

Trifolium dubium.
Lotus corniculatus.
Rubus suberectus.
R. plicatus.
R. Sprengelii.
Lactuca muralis (queried in 'Topographical Botany').
Betula glutinosa.
Lastræa dilatata.

In the notes which follow, the three counties are represented each by its initial letter,—D, M and C.:—

Ranunculus Lenormandi F. Schultz. M. Remarkably abundant; ascending to nearly 2000 ft. on Manod Mawr. C. Bettws y Coed. —*R. hederaceus* L. Seen only by the lakes Tal y Llyn and Llyn Cynwch (M). No other Batrachian seen.

Nuphar? luteum Sm. Form with leaves no larger than those of *pumilum*. M. Llyn Cynwch; in considerable quantity, but not in flower. Seen also in the Festiniog neighbourhood. In Top. Bot. the county is not credited with any *Nuphar*.

Papaver Rhœas L. Seen only in the yard of Valle Crucis Abbey (D).—*P. dubium* L. D. Llangollen; by railroad and in fields near, abundant. Valle Crucis. M. Glyndyfrdwy. No other poppy seen.

Chelidonium majus L. In four spots only, and all near houses, *viz.*, D. At Llangollen and Valle Crucis, sparingly. M. By Cross Foxes Inn (near Cader Idris). Maentwrog.

Corydalis claviculata DC. M. Moel Cynwch. Bwlch Llyn Bach. C. Near Roman Bridge.

Cardamine flexuosa With. Common everywhere (more so than *C. hirsuta*), and ascending to 2000 ft. on Manod Mawr.

Cochlearia danica L. D. By the Dee at Llangollen, on the rocks, in great quantity,—quite twenty miles, I should suppose, from the nearest salt water.

Brassica Rapa L., c. *Briggsii* H. C. Wats. D. By the Dee, at Llangollen, in several spots.

Lepidium Smithii Hook. Apparently rare. D. Near Llangollen. M. Near the Cross Foxes Inn, Cader.

Teesdalia nudicaulis R. Br. D. Geraint Hill. M. Glyndyfrdwy.

Viola palustris L. Remarkably common. — *V. hirta* L. D. Near Llangollen. — *V. Reichenbachiana* Bor. M. By Cwm Camlan. —*V. lactea* Sm. M. Festiniog; heathy places near waterfall, in good quantity, 28th August. Apparently not before recorded from Wales.

Polygala oxpytera Reichb. Geraint Hill. Acrefair—*P. serpyllacea* Weihe. Common. I did not see any well-marked *vulgaris*.

Lychnis alba Mill. D. Llangollen neighbourhood, common. M. Between Dolgelly and Barmouth.

Cerastium semidecandrum L. M. Barmouth.

Arenaria serpyllifolia L. D. Llangollen. Acrefair. M. Barmouth.—c. *leptoclados* Guss. D. Llangollen. M. Tan y Bwlch.

Sagina apetala L. D. Llangollen, in the town and by the Dee. Berwyn. M. Glyndyfrdwy. Dolgelly. Tan y Bwlch. —*S. ciliata* Fr. M. Glyndyfrdwy. — *S. nodosa* E. Mey. D. Acrefair, canal banks, in plenty.

Spergula arvensis L. Very common; usually *vulgaris*, but by the Dee at Llangollen *sativa*.

Lepigonum rubrum Fr. D. Acrefair, common. M. Tan-y-Bwlch. Barmouth.

Hypericum Androsæmum L. Apparently rare. M. Near base of Moel Cynwch. C. Bettws y Coed. -- *H. perforatum* L. Vale of Llangollen, common. Searched for in vain in Merionethshire. — *H. dubium* Leers. The abundance of this plant wherever I went seemed to me to be one of the most noticeable things in the North Wales Flora. I thought it not only the most generally distributed, but literally the commonest *Hypericum*. In Devon and Cornwall it is local and seldom found far from the brookside, while in Dorset it is as yet wholly unknown. — b. *maculatum* Bab. M. Between Blaenau and Festiniog, roadside in open heathy place; several together. At first sight more like *perforatum* than *dubium*. — *H. elodes* Huds. M. Vale of Festiniog,—up to Blaenau, rather frequent.

Malva moschata L. D. Vale of Llangollen and Acrefair, frequent. M. Seen only in two spots near Dolgelly.—*M. rotundifolia* L. D. Llangollen, and here and there along the base of the Eglwseg Rocks. M. Barmouth.

Tilia cordata Mill. D. By the Dee, Llangollen. M. Near Dolgelly; roadside and in wood to "Torrent Walk." Perhaps only planted in both counties.

Geranium pratense L. D. Valley south-west of Llangollen. — *G. pyrenaicum* Burm. f. D. Roadside banks for some distance in several places between Llangollen and Eglwseg Rocks. — *G. columbinum* L. D. Vale of Llangollen to Pentrefelin and base of Eglwseg Rocks, frequent. — *G. lucidum* L. D. Berwyn. Trevor Rocks. M. Dolgelly.

Oxalis Acetosella L. Very common. Up to over 2000 ft. (just below the top) on Manod Mawr.

Impatiens Noli-tangere L. M. In two places (damp and rather shady) three or four miles apart, near Dolgelly; in plenty. I think clearly native here.

Rhamnus Frangula L. By Cwm Camlan and at Tan-y-Bwlch, abundant.

Acer campestre L. Common.

Ulex Gallii Planch. Very common.

Trifolium medium L. Uncommon. D. By the Dee at Llangollen. C. Bettws y Coed.—*T. striatum* L. D. In one place near Llangollen. — *T. hybridum* L. D. Casual; less abundant than in S.W. England. — *T. dubium* Sibth. Very common. "New" for D and C no doubt only in the sense of having been previously overlooked, or not distinguished from the kindred species *procumbens* and *filiforme*.

Lotus corniculatus L. Common. C. Near Roman Bridge. Previously overlooked in this county.

Ornithopus perpusillus L. D. Berwyn. M. Common.

Vicia Orobus DC. M. Festiniog, hilly pasture near waterfall, abundant. — *V. angustifolium* Roth. D. Frequent.

Lathyrus macrorrhizus Wimm. Locally abundant.

Prunus insititia L. By the Dee at Llangollen. M. Glyndyfrdwy. Dolgelly. — *P. avium* L. D. Llangollen. Geraint Hill. M. Near Dolgelly. No *Cerasus* seen. — *P. Padus* L. D. Base of Eglwseg Rocks. C. Bettws y Coed.

Rubus Idæus L. Very Common. — *R. suberectus* Anders. M. Vale of Festiniog, rather frequent. C. Roman Bridge. — *R. plicatus* W. & N. M. Near Tan y Llyn. Vale of Festiniog up to Blaenau (730 ft.), in several spots. C. Roman Bridge. — *R.? nitidus* W. & N. M. Near Festiniog Waterfall, in open ground — *R. affinis* W. & N. M. In one place near Dolgelly.—*R. Lindleianus* Lees. D. Vale of Llangollen, rather frequent. M. Between Barmouth and Dolgelly, roadside. — *R. rhamnifolius* W. & N. Frequent. — *R. incurvatus* Bab. M. Near Dolgelly, abundant. Vale of Festiniog up to Blaenau, locally common. Apparently one of the characteristic brambles of Merionethshire. C. Near Roman Bridge. Here, I believe, must also come a more prickly form which grows among the hills north-west of Valle Crucis Abbey. — *R. rusticanus* Merc. D. and M. Locally common — *R. leucostachys* Sm. Widely distributed, but not seen in great quantity. D. Trevor Rocks, Pentrefelin, &c. M. Dolgelly and Vale of Festiniog. C. Near Roman Bridge and Bettws y Coed. — *R. calvatus* Blox. M. Near Dolgelly. — *R. Maassii* Focke. M. and C. Locally common. — *R. macrophyllus* W. & N. (aggregate). M. Vale of Festiniog, occasional. C. Roman Bridge. Bettws y Coed. — *R. Sprengelii* Weihe. C. Near Roman Bridge (quite typical). — *R. Borreri* Bell-Salt. M. Vale of Festiniog, in several places. C. Near Roman Bridge. — *R.? rosaceus* W. & N. Under this Mr. T. R. A. Briggs (to whom I am again indebted for help in this difficult genus) is inclined to place several of my N. Wales Rubi, including the one which I found at the greatest elevation (over 1000 ft. on Manod Mawr). They appear to me to be the same as

the bramble which reaches nearly 1100 ft. near Buxton, named *pallidus* by Mr. J. G. Baker in 1884, but quite unlike the *pallidus* of Dr. Focke, which I cannot distinguish from the plant usually named *humifusus* by us. Typical *rosaceus* I did not meet with.— b. *Hystrix* Weihe, a very prickly form. M. Between Blaenau and Festiniog, heathy roadside. — *R. echinatus* Lindl. D. Llangollen, roadside bank north of recreation-ground. — *R. fusco-ater* Weihe ? Mr. Briggs thus names a handsome bramble which grew near the last and appears to me to be exceedingly like a Somersetshire plant collected by the Rev. R. P. Murray near Castle Neroche and named *fuscus* by Dr. Focke. — *R. diversifolius* Lindl. D. Well-marked and frequent at Llangollen and Acrefair. — *R.* ? *hirtus* W. & N. C. Roman Bridge, on rocky, marshy hillside; a beautiful form with large ternate leaves and short leafy panicle. — *R. corylifolius* Sm., c. *fasciculatus* P. J. Müll. D. Vale of Llangollen; one of the most abundant and characteristic Rubi. — *R. cæsius* L. D. Llangollen and base of Eglwseg Rocks. M. Barmouth.

Potentilla procumbens Sibth. Local. D. Geraint Hill, in plenty. M. Near Cross Foxes Inn, Cader. Between Blaenau and Festiniog.

Alchemilla vulgaris L. Common.

Agrimonia Eupatoria L. D. Fairly frequent. M. Not seen.— *A. odorata* Mill. Not seen.

Poterium Sanguisorba L. Seen only on Trevor Rocks (D.)

Rosa spinosissima L. M. Barmouth, common. — *R. tomentosa* Sm. Fairly common. — d. *scabriuscula* Sm. D. Near Llangollen, in two places. — *R. canina* L. D. Exceedingly abundant and varied in the Vale of Llangollen and along the base of the Eglwseg Rocks, the commonest forms being *lutetiana*, *dumalis*, *urbica*, and a subcristate one intermediate between *implexa* and *Watsoni*. I also collected *sphærica*, *senticosa*, *biserrata*, *frondosa*, *arvatica*, *obtusifolia* (also at Acrefair), *verticillacantha*, *Koscinciana* and *glauca*. M. At Glyndyfrdwy, *lutetiana*, *dumalis*, *biserrata*, *urbica* and ? *Watsoni*. Near Dolgelly I saw only the common *lutetiana*, *dumalis* and *urbica*. Neither at Blaenau (730 ft. above sea-level), nor at Festiniog (700 ft.), could I find a rose-bush of any kind; but at Maentwrog, several hundred feet lower, I came on a few bushes of *dumalis* and *biserrata*. This remarkable absence of roses from a considerable district about Festiniog would seem to be due either to the slaty soil or to the humidity of climate, as all the species about Buxton commonly reach 900 feet. C. *Dumalis* and *urbica* at Roman Bridge. — *R. arvensis* Huds. Fairly common. I looked in vain for all the other species.

(To be continued.)

SHORT NOTES.

Caithness and West Sutherland Plants. — The accompanying list of plants collected in July this year by the Rev. E. S. Marshall and myself, in company with Mr. J. Grant, will supplement the

paper on the Botany of Caithness and West Sutherland published in Journ. Bot. 1885, p. 333. I may mention that this year we did not go further west in Sutherland than Betty Hill. *Hieracium norvegicum* Fr. we found in two localities in Caithness, and also at Melvich, in West Sutherland; other *Hieracia* were found on the coast in both counties, about which I hope to send a further note after they have been identified. The following records do not appear in 'Topographical Botany,' ed. ii.:—

108. West Sutherland.

Barbarea vulgaris Br.
Polygala eu-vulgaris. Banks east of the Naver.
Sagina maritima Don. By the Naver. Queried for 108 in Top. Bot.
Lepigonum marinum (agg.), Coast at Melvich.
Alchemilla arvensis Lam. Melvich.
A. vulgaris L. Cliffs west of the Naver.
Scandix Pecten-Veneris L. Melvich.
Arctium minus Schk. Cliffs at Melvich.
Hieracium norvegicum Fr. Cliffs at Melvich.
H. prenanthoides Vill. Cliffs at Melvich.
Ajuga reptans L. Base of cliffs west of Naver.
Atriplex patula L. Melvich.
Allium ursinum L. Cliffs west of the Naver.
Carex Oederi Ehrh. Melvich, and east side of Naver.
Phragmites communis Trin. By the Naver.
Glyceria maritima Wahl. East side of the Naver.
Agropyron repens Beauv. By the Naver.
Equisetum sylvaticum L. At Strathy, and near Betty Hill.

109. Caithness.

Ranunculus Drouetii Godr. Dunnet Links.

R. heterophyllus Web. ex p. At Castletown, and in a burn on the Reay Links.

Fumaria officinalis L. Cornfield at Reay.
Polygala eu-vulgaris. By the Thurso River.
Myosotis repens D. Don. By Loch Winless.
Salix phylicifolia "L." Loch Duran.
Potamogeton nitens Web. Wick River. Thurso River, and in Loch Winless.

Scirpus fluitans L. In a pond by the road between Wick and Castletown.

Carex disticha Huds. Wet meadow north of the Wick River, about 1½ miles from Wick.

C. capillaris L. Dunnet Links.
C. Oederi Ehrh. By the Wick River.
—Frederick J. Hanbury.

Thesium linophyllum and its host plants. — Text-books usually state this plant to be parasitic on the roots of various plants, but do not mention any of the hosts, while other botanical books make no mention of the fact of its being parasitical at all. Having found it in two widely-separated localities in Sussex, and also in the Isle of Wight, on turf-clad, chalky cliffs, downs or

pastures, I took the trouble to dig up a number and examine the roots. The latter were generally considerably branched, ultimately ending in slender fibres, which were more or less abundantly furnished with disk-like haustoria, flattened on the lower surface, that is towards the host-plant. The thicker branches of the root were occasionally furnished with haustoria, possibly on coming in contact with a suitable host. The plant is by no means fastidious in this respect, but seems to accommodate itself to most things frequenting the same spot, although belonging to widely separated natural orders. The following is a list of those having haustoria attached to their roots:—*Lotus corniculatus*, *Anthyllis Vulneraria*, *Medicago lupulina*, *Ononis arvensis*, *Hieracium Pilosella*, *Ranunculus bulbosus*, *Plantago lanceolata*, *Viola hirta*, *Thymus Serpyllum* var. *Chamædrys*, *Asperula cynanchica*, *Galium verum*, *Dactylis glomerata*, *Festuca ovina* var.—J. Fraser.

Hampshire Plants. — On a visit of the members of the West Sussex Natural History Society to Hayling Island at the beginning of September last, *Gnaphalium luteo-album* was met with not far from the shore opposite Southsea, near a gravel-pit, where, if not certainly wild, it appeared fairly established in some quantity. *Juncus acutus* has also been discovered by Mr. W. H. R. Fletcher in a secluded part of the island, whence he has kindly sent me specimens; the occurrence of this species in Hants has been hitherto doubted.—F. H. Arnold.

Epilobium angustifolium L. in Cambridgeshire. — This plant grows by a farm-roadway in the parish of Chatteris, but, as it is not spread along ditch-sides and similar wild places, it must be looked upon as a probably introduced plant. Two undoubted aliens are obtaining a secure footing on our arable land; one is *Polygonum tataricum* L., kindly named for me by my friend Mr. A. Bennett. This species holds its footing amongst the "weeds of cultivation" much more firmly than its congener, *P. Fagopyrum*, which, although frequently grown as a crop, usually disappears after one or two seasons. The second is *Oxalis stricta* L., a plant we are not likely to lose, as, if its freely-produced mint-like stolons succumb to some unusually severe winters, it is sure to spring up from its freely-produced seed. Both these plants seem spreading since first noticed in this locality three or four seasons ago.—Alfred Fryer.

Rubus leucocarpus in West Gloucestershire (see Journ. Bot. 1882, p. 346).—I send you herewith some fruits of an amber-fruited bramble from a new locality—the third in our Bristol district. These were gathered by Mr. Tuckett near Frenchay, about four miles N.E. from Bristol. Although consisting only of panicle, one can yet certainly determine that the specimens belong to the same species that has twice already yielded us this amber-coloured fruit, *viz.*, the plant formerly known as *R. discolor* W. & N., but which is now shown to be *R. rusticanus* Merc. Is it not remarkable that all three instances of the occurrence of this variety in Britain during the last two centuries should be recorded within the area of the Bristol Coal-field?—J. Walter White.

East Gloucester "New Records."—I found this year (July 30th to August 3rd) at Churchdown and on the Cotswold side of Cheltenham the following plants not hitherto recorded for the vice-county:—*Papaver Lecoqii*, *Polygala serpyllacea*, *Arenaria leptoclados*, *Sagina apetala*, *Rubus rhamnifolius*, *R. rusticanus*, *R. leucostachys*, *R. corylifolius*, *Epilobium tetragonum*, *E. obscurum*, *Petroselinum segetum*, *Galium elongatum*, *Arctium minus*, *Veronica persica*, *Juncus glaucus*, and *Carex divulsa*; also the following varieties of *Rosa canina*,—*lutetiana*, *dumalis*, *urbica*, *obtusifolia*, *tomentella*, *verticillacantha*, and *glauca*.—W. Moyle Rogers.

New Surrey Plants.—This summer I have paid some attention to the Thames-side portion of the Bourne Brook basin—a part which had not been previously worked. Several species which are very rare, or nearly extinct, elsewhere in the county occur here, and, besides these, the two following new records were obtained:—*Potamogeton zosterælolius* Schum., which was found very sparingly in a slow ditch; and *Tolypella intricata* Leonh., several fine tufts of which were found in another ditch.—W. H. Beeby.

Callitriche truncata Gussone in West Kent. — Last Easter, when looking through Borrer's Herbarium for Surrey records, I noticed a *Callitriche* collected by the late G. E. Smith "in the stream at Westerham," and named "*C. pedunculata*." It was evident that the plant could be referred only to the above species or to *C. autumnalis* L. In June I was so fortunate as to find the plant in the locality indicated, but I have not succeeded in getting it in ripe fruit. The occurrence of *C. autumnalis* in Kent is, however, more than improbable, and the presumption is all in favour of the other species. The single immature fruit found shows no sign of a wing, and I think that the plant may be considered *C. truncata* Gussone; though it is to be hoped that ripe fruit will be found on some future occasion. The locality in which the plant occurs is only a mile from the county border; but I have not detected it in Surrey, in which county it is not, however, unlikely to be found.—W. H. Beeby.

Pinguicula vulgaris in South Beds. — On the Markham Hills, with a northerly aspect, this plant grows in fair quantity. It was first noticed two or three years ago when in blossom by Mr. C. Crouch, but at present its area is rather more restricted than when first observed. It grows on the open hill-side, in some places on the bare chalk, and where there is not the least suggestion of marsh or bog, which is its usual habitat. Associated with it *Parnassia palustris* occurs plentifully, also on the open hill-side. For some time the existence of these plants in such a situation seemed inexplicable. Noticing, however, that they grow on the side of one of the coombes so frequent in our chalk hills, at the bottom of which a small spring still exists, and that beside the rivulet to which the spring gives rise are a few tufts of *Carex binervis*, it seems probable that formerly there existed a marshy meadow in the hollow, when the springs were higher, and that the three plants mentioned above are relics of an ancient

paludal flora that found a congenial habitat in the locality, but which had gradually dwindled away as the moisture diminished. The *Parnassia* and Butterwort maintained a hold on the adjoining hill-side, as it had a northerly aspect; and so were not dried up, but still lingered on amongst such mosses as *Hypnum molluscum*, *H. purum*, and *H. squarrosum*. In further confirmation of the suggested solution of the difficulty it may be mentioned that the three plants, *Pinguicula*, *Parnassia*, and *Carex binervis*, occur rather plentifully in a marshy meadow on chalky soil at Totternhoe, Beds. They are, however, not so abundant in this station as they were some ten years since, when they were first observed by Mr. Worthington Smith. Drainage is diminishing their numbers, as also that of the locally rare *Anagallis tenella*.—J. Saunders.

Carum Carvi in South Beds. — This plant grows plentifully in several meadows called "Totternhoe Meads," and in such circumstances as to suggest that the species is indigenous to the locality. It grows associated with a rich, truly native flora, its foliage forming a considerable portion of the herbage, and the station is remote from habitations, I have also found this species as a casual in South Beds, growing on the Midland Railway in Flitwick Parish, but the circumstances were very different from the former, in which it forms an appreciable proportion of the greensward of several ancient pastures.—J. Saunders.

NOTICES OF BOOKS.

Revision de Plantas Vasculares Filipinas, Memoria elevada al Exemo. Sr. Ministro de Ultramar. Por D. Sebastian Vidal y Soler, Inspector General de 2a. Clase, Jefe de la Comision. Manila, 1886. 8vo, pp. 454. 2 plates.

This valuable contribution to Philippine Botany, published by authority of the Spanish Government, is not exactly a revision of the vascular plants of the islands, as its title would indicate. It is really the Report of the Chief of the Forest Flora Commission to the Spanish Ministry, with a revision of the plants collected by him. The introductory report, which extends to thirty pages, gives an account of the author's visit to Europe in 1882–83, for the purpose of working up his collections, and includes notices of the herbaria visited by him, *viz.*, Kew, the British Museum, Paris, and Madrid. A few of the principal features of the Philippine Flora are also pointed out in it.

The Systematic Catalogue deals with numbers 1 to 2000 of the Philippine collections, half of which were determined jointly by Don S. Vidal and myself; the remainder, which were forwarded by the former after his return to Manila, being worked up by me. After the Systematic Catalogue is a numerical one, an Index of Genera, an abbreviated bibliography of works consulted, and an Appendix, with two plates, devoted to *Strychnos Ignatii* Bergius, the

St. Ignatius's Bean—a source of the poisonous drug, strychnine, of which the botanical information has up to the present time been extremely imperfect.

The following new species are described by the author. The respective pages are annexed, but, as no sets have been distributed, the numbers are not given. A complete set of the whole collection is, however, deposited at Kew. A few of Cuming's distributed numbers are quoted, and these I reproduce :—

Wormia luzoniensis, p. 36.
Artabotrys Rolfei (*A. suaveolens* Vidal, Sinops.* tab. 4, fig. D, non Blume), p. 39.—Cuming, n. 1099, 1495, & 1818.
Saccopetalum longipes, p. 43.
Pycnarrhena manillensis, p. 45.
Berberis Barandana, p. 45.
Gordonia luzonica, p. 57.
G. acuminata, p. 58.
Dipterocarpas velutinus, p. 59.
Heritiera sylvatica, p. 66.
Pterospermum niveum, p. 67.—Cuming, n. 1163.
Diplophractum philippinense, p. 71
Beddomea luzoniensis, p. 84.
Kurrimia luzonica, p. 88.
K. gracilis, p. 89.
Caryospermum philippinense, p. 89.
Ventilago luzoniensis (*V. maderaspatana* Vidal, Sinops. tab. 32, fig. D, non Gærtn.), p. 90.
Berchemia philippinensis, p. 91.
Ellipanthus luzoniensis (*E. Helferi* Vidal, Sinops. tab. 39, fig. B, non Hook. f.), p. 104.
Gleditschia Rolfei, p. 115.
Eriobotrya philippinensis, p. 123.
Deutzia pulchra, p. 124.
Weinmannia luzoniensis, p. 125.
Rhodamnia glabra, p. 129,
Astronia pulchra, p. 136.
A. calycina, p. 136.
Lagerstræmia Batitinan (*L. hexaptera* Vidal, Sinops. tab. 52, fig. A, non Miq.), p. 139.
Homalium Villarianum, p. 142.
Adina philippinensis. (*A. polycephala* Vidal, Sinops. tab. 56, fig. B, non Benth.), p. 148.
Xanthophytum Villarii, p. 150.
Gardenia longiflora, p. 153.
Centratherum fruticosum, p. 159.
Vernonia arborea Ham., var. *vestita*, p. 160.—Cuming, n. 495.
Gynura purpurascens, p. 164.
Lactuca luzonica, p. 165. — Cuming, n. 1642.
Vaccinium Villarii (*V. varingiæfolium* Vidal, Sinops. tab. 60, fig. D, non Miq.), p. 166.—Cuming, n. 935.
V. Cumingianum (*V. sp.?* Vidal, Sinops. tab. 60, fig. C), p. 167.—Cuming, n. 805.
V. luzoniense, p. 168.
V. benguetense, p. 168.
V. Barandanum, p. 169.
V. indutum, p. 169.
Rhododendron Quadrasianum, p. 170.—Cuming, n. 804.
R. verticillatum,† p. 171.
R. rosmarinifolium, p. 172.
Symplocos Villarii, p. 178.
S. pseudo-spicata (*S. spicata* Vidal, Sinops. tab. 64, non Roxb.), p. 179.
S. montana,‡ p. 179.

* Vidal, 'Sinopsis de Familias y Generos de Plantas lenosas de Filipinas.' Manila, 1883.

† As there is already a *Rhododendron verticillatum* Low in Journ. Hort. Soc. iii. pp. 86 & 87, with figure; Hook. Ic. Pl. t. 884; from Borneo, I propose to call this *R. Vidalii*.—R. A. R.

‡ There is already a *Symplocos montana* Brong. & Gris. in Ann. des Sc. Nat. ser. 5, vi. p. 250, from New Caledonia: I therefore propose to call this *S. luzoniensis*.—R. A. R.

Linociera coriacea, p. 181.
Alyxia monilifera (*A. stellata* Vidal, Sinops. tab. 67, fig. B, non Rœm. & Schultes), p. 182.
Parsonsia Rheedii F. Villar (*P. spiralis* Vidal, Sinops. tab. 66, fig. E, non Wall. — *Echites spiralis* Blanco. — *Heligme Rheedii* Naves, in Blanco, Fl. Filip. ed. 3, tab. 310, non Wight), p. 184.
Crawfurdia luzoniensis, p. 191.
Cordia Blancoi (*C. Sebestena* Naves, in Blanco, Fl. Filip. ed. 3, t. 43, excl. syn., non L. —*C. Myxa* Vidal, Sinops. tab. 70, fig. D, non L.), p. 192.— Cuming, n. 1202.
Ehretia Navesii (*Menais mollis* Blanco. — *Ehretia virgata* Naves in Blanco, Fl. Filip. ed. 3, t. 70, excl. syn., non Blanco), p. 194.
Cryptocarya luzoniensis, p. 222.
C. Villarii, p. 222.
C. ilocana, p. 223.
Beilschmiedia Cairocan (*B. sp.?* Vidal, Sinops. tab. 78, fig. F), p. 223.
Cinnamomum Mercadoi (*C. iners* Vidal, Sinops. tab. 78, fig. A, non Reinw.), p. 224.
Litsea Perottetii F. Villar, var. *parviflora*, p. 225.
L. Perottetii F. Villar, var. *Villarii*, p. 225.
L. verticillata, p. 226.
L. obtusata F. Villar, p. 226.
L. albayana, p. 227.
L. Garciæ, p. 228.
Buxus Rolfei, p. 233.
Cleistanthus Blancoi (*Gluta orgyalis* Blanco ("probably"), p. 234.
C. cupreus,* p. 235.
Phyllanthus gigantifolius, p. 236.
Agrostistachys Mæsoana, p. 242.
Taxotrophis ilicifolia, p. 249.
Bœhmeria Weddeliana, p. 256.
Quercus Soleriana (*Q. costata*, var. *convexa* Naves in Blanco, Fl. Filip. ed. 3, t. 441, non Bl.), p. 261.
Q. Castellarnauiana, p. 264.

The following transfers† are here made, apparently for the first time :—

Hopea plagata (*H. odorata* Vidal, Sinops. tab. 15, fig. A, excl. fig. 5 (a fruit placed here by error), non Roxb. — *Mocanera plagata* Blanco (ed. 1).—*Dipterocarpus plagata* Blanco (ed. 2). — *Anisoptera plagata* Blume), p. 62.

Badusa philippica (*Cinchona philippica* Cav.—*Erostemma philippicum* Rœm. & Schultes), p. 150.

Chrysopogon villosulis (*Andropogon villosulis* Steud.), p. 291.

It should be added that a number of plants are interpolated in the Systematic Catalogue from the collections of Cuming and others, but a thorough revision dealing with the involved synonymy of Blanco and other writers is still a desideratum. This cannot be done until the Philippine collections in European herbaria are more complete; but let us hope, as so good a beginning has been made, that the materials for such a work will in due time be forthcoming.

R. A. Rolfe.

---

* *Nanopetalum myrianthum* Hassk. will stand as a synonym of this species; that genus being now reduced to *Cleistanthus*.

† In my Review of 'Phanerogamæ Cumingianæ Philippinarum' (*supra*, pp. 57—60) the following transfer was accidentally overlooked:—*Gardenia obscura* (*Remijia obscura* Blanco.—*Randia obscura* Vidal, Sinops. t. 57, fig. B), p. 119.—Cuming, n. 744, 745.

Recent Books on Bacteriology.

The literature of this subject is growing at a rate which is little short of alarming to the botanical student who wishes to keep pace with the progress made in this fashionable branch of Biology. The number of books is out of proportion to the number of papers on the subject, judged by the ordinary standard. When one has invented a new sterilizing kettle, or some such instrument, it seems to be necessary to write a handbook of Bacteriology founded for the most part on previous works, but giving special prominence to, say, the kettle—the primitive type of which is undoubtedly the original domestic "potato-steamer." Certainly the student of Bacteriology need not want guidance from the very beginning of things. He is even supposed not to know how to cut a potato in two; and Drs. Woodhead and Hare, at p. 61 of their 'Pathological Mycology,' and Dr. Crookshank, at p. 79 of his 'Practical Bacteriology,' show him with the aid of a diagram how to do this. It is conceivable that were the untutored bacteriologist left to himself he would employ another method of doing this with less appearance of danger of cutting his hand. These things are mentioned because there appears to be a tendency towards this study becoming an affair of inventing sterilizing methods and apparatus and staining fluids,—all no doubt excellent and necessary things,—but, when made too prominent, apt to overshadow the Bacteria themselves. There is also in some of the writers an ignorance of the history of research in the allied field of Mycology, and consequently this history has been repeating itself, sometimes in very striking ways. The ideas of Pleomorphy entertained by some bacteriologists are just as extravagant as the case cited by De Bary in the early history of Pleomorphy in Fungi. He tells us that it was gravely affirmed in those days, of *Saccharomyces cerevisiæ*, that if it were eaten by flies it gave rise in those insects either to *Entomophthora*, or to *Mucor* if they were on a damp substratum, or if they fell into the water to *Achlya*. From the *Mucor* again they derived *Saccharomyces* in a sugar solution, &c.

However, progress has been made, in spite of all these things since the study got a fair start with the establishment by Lankester in his account of the peach-coloured *Bacterium* of the relationship of the forms of Schizophytes with each other. His work has borne fruit in the hands of many observers, and we seem to be nearer a Natural History of these organisms than before, though little does your pathologist care for that as a rule.

Among recent books there is to be noted a new edition of Cornil and Babes' very comprehensive and well-illustrated book, 'Les Bactéries. The volume in the International Scientific Series by Dr. Trouessart, entitled 'Les Microbes, les Ferments, et les Moisissures,' is not a very creditable performance, while its illustrations are simply ghastly; and the book is quite equalled in this latter respect by Roster's 'Il Pulviscolo atmosferico.' A book which no serious student of the subject can do without is Hueppe's 'Formen der Bakterien und ihre Beziehungen zu den Gattungen

und Arten' (Wiesbaden. C. W. Kreidel, 1886). It forms a companion to the same author's 'Die Methoden der Bakterien-forschung' published last year (by the same publisher). It is in very handy form, and well illustrated. A very useful kind of publication is Eisenberg's 'Bakteriologische Diagnostik' (Hamburg and Leipzig, L. Voss, 1886). In it there is set forth in handy tabular form a description of the more important *Schizophytes*. 'Die Untersuchungs-methoden,' by Drs. Huber and Becker (Leipzig, Vogel, 1886), is a book on the familiar plan dealing with instruments, reagents, methods of preparation, staining methods, preserving substances, &c., by Dr. Huber, while the account of the Bacteria themselves is given by Dr. Becker. It is well written and illustrated. Finally, a Dictionary of Bacteriology has been published, called 'Wörterbuch der Bacterienkunde,' von Dr. W. D. Miller (Stuttgart, Ferdinand Enke, 1886). It is in German, and is doubtless a useful publication, but greatly disfigured from the botanical point of view by the names appearing in it without any authority. One or two minor blunders are more absurd than serious—such as describing *Melampsora* as a *species* of fungus, &c.; and the spelling, which one would expect to be correct in a dictionary—and a small dictionary—leaves room for revision. For example, "*Uromycetes*" is abominable, because it looks like the name of a new natural order. "*Sphacelia*" is described as a genus of Fungi which now-a-days is ridiculous, and so on. If Dr. Miller would simply omit these names of Fungi, which have nothing in the world to do with Bacteriology, he would omit a serious number of errors. GEORGE MURRAY.

UNDER the title 'Bibliotheca Botanica' and the editorship of Drs. Uhlworm and Haenlein, a series of Memoirs, fully illustrated, is being issued by Fischer, of Cassel. Each issue is complete in itself: those already published are (No. 1) 'Vergleichende Anatomie der submersen Gewächse' (by Dr. H. Schenck (pp. 67, tt. 10); (No. 2) 'Ueber die Gerbstoffund Anthocyan-Behälter der Fumariaceen und einiger anderen Pflanzen' (pp. 40, tt. 3); and (No. 3) 'Ueber Verbascum-Hybriden und einige neue Bastarde des *Verbascum pyramidatum*' (by Dr. V. Schiffner (pp. 15, tt. 2).

NEW BOOKS.—H. LACHOT, 'Flore élémentaire' (plants of Semur, Côte d'Or), (12mo, pp. xvi. 240). — C. SALOMON, 'Wörterbuch der botanischen Gattungsnamen'; and 'Wörterbuch der botanischen Kunstsprache für Gartenfreunde' (Stuttgart, Ulmer, "1887": 12mo, pp. iv. 292, & iv. 92). — J. BRITTEN and R. HOLLAND, 'Dictionary of English Plant-names' (part iii., completing the work: Trübner.). — E. PFITZER, 'Morphologische Studien ueber die Orchideenblüthe' (Heidelberg, Winter: 8vo, pp. 139, 65 cuts). —E. VOGES, 'Das Pflanzenleben des Meeres' (Leipzig, Frohberg: 8vo, pp. 83, 25 cuts).—J. L. DE LANESSAN, 'Les Plantes Utiles des Colonies Françaises' (Paris, Imprimerie Nationale: 8vo, pp. iv. 990).

Articles in Journals.

Ann. & Mag. Nat. Hist. (Oct.).—W. Fawcett, 'An entomogenous Fungus' (*Cordyceps Lloydii*, sp. n.).

Bot. Centralblatt. (Nos. 42–45).—C. Hassack, 'Untersuchungen über den anatomischen Bau bunter Laubblätter, nebst einigen Bemerkungen, betreffend die physiologische Bedeutung der Buntfärbung derselben.'

Bot. Gazette (Sept.). — A. Gray, 'Essay toward a revision of *Dodecatheon*' (*D. Hendersoni*, sp. n.).—W. G. Farlow, 'Development of *Gymnosporangia* of U. States.' — D. E. Salmon, 'The Theory of immunity from contagious diseases.' — W. J. Beal, 'Expulsion of seeds of *Sporobolus cryptandrus*.'

Bot. Zeitung (Oct. 1, 8). — J. Wortmann, 'Ueber die Natur der rotirenden Nutation der Schlingpflanzen.' — (Oct. 15, 22). A. Meyer, 'Ueber die wahre Natur der Stärke-Cellulose Nägeli's.'

Bull. Torrey Bot. Club (Oct.). — E. L. Scribner, 'The Orange-leaf Scab.' — J. S. Newberry, '*Pinus monophylla & P. edulis*.'— N. L. Britton, 'On *Anychia*.'—*Aconitum Noveboracense* A. Gr., n. sp.

Flora (Sept. 11). — O. Bachmann, 'Untersuchungen über die systematische Bedeutung der Schildhaare' (contd.: 5 plates).— (Sept. 21, Oct. 1). —. Röll, 'Zur Systematik der Torfmoose.'— H. G. Reichenbach, '*Sievekingia*' (*S. fimbriata*, *S. Jennani*, spp. nn.).

Gardeners' Chronicle (Oct. 2). — A. D. Webster, '*Spiranthes Romanzoffiana*.'—*Amorphophallus Titanum* (figs. 88, 89),—Development of *Trientalis europæa* (fig. 90). — (Oct. 9). *Gongora flaveola* Rchb. f., *Aristolochia salpinx* Mast. (fig. 92), spp. n.—*Larix Griffithii* (fig. 95). — (Oct. 16. *Odontoglossum Harryanum* Rchb. f., *Dendrobium hercoglossum* Rchb. f., spp. nn. — *Tsuga Brunoniana* (fig. 101).—(Oct. 23). *Habenaria militaris* Rchb. f., sp. n.—*Orchidantha* (gen. nov., *Scitamineæ*) *borneensis* N. E. Br.—(Oct. 30). *Dendrobium inauditum* Rchb. f., *Esmeralda Clarkei* Rchb. f., spp. nn.

Notarisia (Oct.).—G. B. De Toni & D. Levi, 'Censimento delle Diatomacee Italiche finora scoperte.' — Id., 'Schemata generum Floridearum' (contd.: 3 tab.).

Oesterr. Bot. Zeitschrift. (Oct.).—J. B. Wiesbaur, 'Neue Rosen von östlichen Erzegebirge.'—A. Hausgirg, 'Der Salzwasser Algenflora Böhmens.' — E. Formánek, 'Flora der Carpathen.' — L. Schlögl, 'Der Pilzmarkt in Ung. Hradisch.'

Scottish Naturalist (Oct.). — O. Nordstedt, 'British Submarine *Vaucheriæ*' (1 plate).

Trans. Linn. Soc. (Botany, 2nd Ser. ii. pt. 9). — J. D. Hooker, '*Castilloa elastica*' (1 plate).—(pt. 11, Sept.). G. Murray, 'A new *Rhipilia* (*R. Andersonii*) from Mergui Archipelago'; and 'Two new species of *Lentinus*' (*L. sclerotieola* and *L. Taylorii*), (1 plate).—(pt. 12, Oct.). W. Fawcett, 'New species of *Balanophora* and *Thonningia*, with a note on *Brugmansia Lowi*' (*Balanophora Zollingerii*, *B. decurrens*, *B. ramosa*, *B. multibrachiata*, *B. Forbesii*, *Thonningia malagasica*, spp. nn.: 4 plates).

ON THE MONOCOTYLEDONOUS PLANTS OF NEW GUINEA COLLECTED BY MR. H. O. FORBES.

By H. N. Ridley, M.A., F.L.S.

(Plates 270 & 271).

(Concluded from p. 327.)

Coelogyne Rumphii Lindley, Fol. Orchid. No. 36. — *Angræcum nervosum* Rumphius, Herb. Amboin. vi. t. 48. — Sogere, 2000 ft., No. 24.

I have no doubt but that this plant is the species intended by Rumphius in the above-quoted plate. Lindley never saw any specimen, and I do not know that it has ever been met with by anyone since Rumphius' time till the present day. As no description except Rumphius' has been published, I append one:—Pseudobulbi elongati, angusti 2 uncias longi. Folium singulum erectum lanceolatum plicatum acutum in dorso 7-nervium, 12 uncias longum, 2 uncias latum. Scapus 6–8 uncias longum folio haud æqualis. Racemus pauciflorus flexuosus. Flores magni 4–5. Bracteæ lanceolatæ membranaceæ brunneæ mox deciduæ. Sepalum posticum erectum lanceolatum, lateralia late lanceolata, acuta. Petala angusta linearia acuta. Labellum ellipticum oblongum trilobum, lobi laterales obtusi rotundati erecti obliqui, medius obcordatus latus oblongus rotundatus cuspidatus: carinæ tres rufæ sinuatæ, duæ externæ quam media longiores ad isthmum lobi media productæ. Labellum album medio aurantiaco. Columna basi angusta flava arcuata, apice late dilatato aurantiaco, alis latis longisque superne rotundatis clinandrium integrum obtegentibus. Anthera galeata incomplete biloculata. Stigma latum profundum oblongum marginibus elongatis.

Coelogyne pustulosa, n. sp.—Folia desunt. Scapus 8 uncialis flexuosus validulus. Bracteæ membranaceæ lanceolatæ unciales, convolutæ, pedicellum et ovarium involventes. Flores magni. Sepala lanceolata acuta $\frac{3}{4}$-uncia longa ferme $\frac{1}{4}$-uncia lata. Petala angustiora lanceolata lorata $\frac{3}{4}$-uncialia. Labellum unciale trilobum lobi laterales acuti subfalcati venis rufis, medius longior angustus ellipticus oblongus apice emarginato cuspide minuto obtuso, carinæ duæ obtusæ vix elevatæ inter lobos laterales, in medio incrassatæ et pustulosæ, disco lobi medii etiam rufo-pustulosus, marginibus tenuibus pallidis. Columna gracilis arcuata ventre parce pubescente. Alæ clinandrii breves antheram haud tegentes. Anthera galeata, pallida. Rostellum latum cartilagineum involutum. Stigma prominens ovatum. Alæ columnares angustæ. Pollinia splendide citrina, basibus in disco plano subtriangulari molli citrino sessilibus.

South Cape.

Although I have seen no more than a single flower-spike, this beautiful plant seems so distinct that I have ventured to describe and name it.

Spathoglottis plicata Blume.—"Flowers rose-coloured, with the wings and tip of labellum dark rose-purple, the lower part close to

the column bright orange." Mt. Korkoko, at 2000 ft. elevation, No. 630; also obtained at Jobie Island by Barclay, and recorded from Segaar Bay, Western New Guinea, by Dr. Kranzlin. This species is one of the most widely spread of Tropical Asiatic orchids, occurring from Penang to Austraiia, which is especially interesting, as the plant is self-fertilized.

Spathoglottis stenophylla, n. sp.—Planta glabra basi bulbosa. Folia plura angusta lanceolata plicata petiolata, acuminata, 12 uncias longa, ½-uncia lata. Scapi circiter bipedales graciles, vaginis paucis arctis striatis remotis acutis uncialibus. Bracteæ semi-unciales ovatæ lanceolatæ acutæ. Flores, iis *S. plicatæ* minores purpurei erecti in pedicellis gracilibus uncialibus. Sepala ovata obtusa. Petala angustiora, subæquilonga. Labellum trilobum, lobi laterales spathulati obcuneati obliqui, medius glaber sub-æqualis spathulatus obcuneatus apice rotundato, subintegro, ungue brevi, ad basin lobi medii cornua duo complanata truncata. Columna semiteres, parum curva, alis angustissimis. Capsula uncialis elliptica subcylindrica.

Sogere. Self-fertilized. No. 514.

This species has somewhat the habit of the narrow-leaved form of *S. plicata* (*Bletia angustata* Gaud. Voy. Uranie, p. 421; *B. angustifolia* ejusd Pl. 32), but has much smaller flowers, with a shorter lip, of which the lobes are nearly equal, owing to the shortening of the claw of the median lobe, which is long and narrow in the common species.

Acanthephippium javanicum Bl. — Terrestrial. Flowers yellow, streaked with red, centre orange. Lip cream-yellow to pink tinge. Sogere, 2000 ft., Nos. 389, 390.

Cyrtopera papuana, n. sp. — Folia ignota. Scapi validi bipedales, in rhizomate lignoso vaginis brunneis tecto, basi paullo incrassati. Racemus superne comosus laxus multiflorus. Flores magni. Bracteæ setaceæ unciales. Pedicelli ½-uncia longi. Sepala lanceolata acuminata ¾ uncia longa ¼ uncia lata. Petala breviora obtusiora. Labellum trilobum oblongum cuneatum basi brevissime calcaratum lobis brevibus ferme æqualibus ovatis, discus pubescens carinis brevibus 2 in venis medianis. Columna gracilis alis latis rotundatis. Pollinia 2 triangularia. Anthera galeata apiculata.

Sogere, No. 391. The whole plant dries black.

Appendicula disticha, n. sp., Tab. 270.—Cæspitosa. Caules plures, semipedales, erecti. Folia elliptica oblonga emarginata cuspide minuto acuto, ½-uncia longa, ¼-uncia lata, vaginæ ¼-uncia longæ ampliatæ. Spica terminalis nutans, densus, bracteæ arcte approximatæ bifarium distichæ lanceolatæ cuspidatæ 2 lineas longæ, virides. Flores minimi tenues flavescentes (in sicco). Sepala ovata cuspidata lateralia apicibus deflexis. Petala angustiora linearia obtusa. Labellum oblongum obcuneatum, sepalo æquale, basi angustata, callis duobus inter quos canaliculo, apice sub-trilobo obtuso, lateribus tenuibus, disco incrassato carnosulo. Calcar brevissimum obtusum. Columna brevi, clinandrio haud profundo. Rostellum bifidum, lobis acutis rectis. Stigma ovatum triangulum.

Anthera obtusa lata. Pollinia longa pyriformia acuta, attenuata: stipites tenues elongatæ-triangulares, glandula elliptica parva. Capsula 2 lineas longa, elliptica oblonga.

South Cape.

This curious plant is remarkable for its flattened spike of distichous bracts.

Trichoglottis leontoglossa, n. sp. — Caulis 6 uncias longus validulus, vaginis foliorum antiquorum striatis ½ uncialibus. Folia lanceolata acuminata subobtusa apice biloba coriacea ½ uncia lata, uncia longa. Flores parvi carnosi 1–2 in vagina subsessiles (ex sicco), flavi purpureo-maculati. Sepala $\frac{3}{16}$-uncia longa lanceolata ovata obtusa marginibus involutis. Petala multo breviora lanceolata obtusa. Labellum trilobum, lobi laterales tenues breves erecti late lanceolati acuti paullo obliqui, lobus medius carnosus crassus linguiformis obtusus, discus pubescens, basi et in pagina inferiore canaliculatus marginibus canaliculi ad basin incrassatis. Calcar breve crassum rectum clavatum apice bilobo. Columna brevis crassa quadrata, stigmate profundo magno, quadrato. Clinandrium profundum, marginibus erectis. Anthera incomplete biloculata depressa quadrata.

Sogere, at 2000 ft., No. 839.

Goodyera papuana, n. sp. — Herba 16 uncias alta. Folia 5, oblique lanceolata acuminata, lævigata, multinervia, petiolata, basi ampliata vaginata, vagina membranacea uncialis, petiolus 1¾ uncia longus. Lamina 5 uncias longa, 1½ lata. Scapus pubescens. Bracteæ angustæ lanceolatæ, longe acuminatæ, inferiores uncia longæ. Racemus densiusculus, multiflorus, rachide dense glanduloso-pubescente. Bracteæ florales, flores superantes glanduloso-pubescentes. Flores iis *G. fumatæ* Thw. æquales. Sepala lateralia angusta lanceolata subacuta extus pubescentia, galea latior, erecta. Labellum latum ovatum subacutum concavum, intus villosum. Columna angusta, antice villosa. Rostellum angustum bifidum. Pollinia vix caudiculata. Stigma subintegra. Capsula elliptica oblonga, perianthio persistente coronata, parce pubescens, ¾-uncia longa.

Sogere. New Guinea, *H. O. Forbes*, No. 64.

The affinity of this plant is with *G. fumata* Thw., of Ceylon.

Corymbis veratrifolia Rchb. f.—Flowers white. Sogere, No. 763.

Apostasiaceæ.

Neuwiedia calanthoides, n. sp., Tab. 271. — Rhizoma diu repens, crassiusculum, vaginis tectum, et radices crassas lignosas emittens. Caulis ascendens. Folia vaginantia plura, anguste linearilanceolata acuminata petiolata, 24 uncias longa, 1½ uncia lata, vaginis costatis. Scapus pubescens vaginis dissitis tectus, validulus bipedalis erectus. Racemus multiflorus comosus. Bracteæ inferiores 1½ uncia longæ virides pubescentes. Flores majores carnosuli, ochraceo-flavi. Sepala ferme ½ uncialia angusta lanceolata-linearia, pubescentia. Petala latiora lanceolata, extus carina depressa pubescente, cum sepalis cuspidata. Labellum angustum lanceolatum, medio incrassato subtus pubescente, marginibus tenuibus glabris.

Antheræ angustæ lineares brunneæ. Filamenta complanata, ultra dimidio libera. Stylus cylindricus filiformis versus apicem attenuatus, antheris brevior. Stigma parvum rotundatum. Ovarium ½-uncia longum pubescens, breviter rostratum.

Mt. Meroka, at 2000 ft., under shade.

This species is larger than any other which I have seen, and is remarkable for its very narrow leaves, the whole plant looking, before the flowers are open, very much like a Calanthe in bud. The so-called column, formed of the bases of the filaments and the style, is very short, less than half the length of the filaments. The backs of the sepals and lip are pubescent, as is that portion of the petals which is visible before the flower opens; but the edges of the petals, which are then covered by the sepals, are glabrous.

Scitamineæ.

Tapeinochilus pungens Miquel.—Sogere, Nos. 142, 143, 144.

Several inflorescences of this fine plant were obtained by Mr. Forbes.

Tapeinochilus pubescens, n. sp. — Rhizoma crassum lignosum, squamis velutinis tectum. Folia ignota. Strobilus 8–24 uncialis. Bracteæ squamæformes, inferiores (vacuæ) ovatæ, superiores (floriferæ) late ovatæ acuminatæ apicibus recurvis, brevissime pubescentes, 1½ uncia longæ, uncia latæ (quo latissimæ). Flores singuli in bractea, biunciales ferme omnino pubescentes. Sepala connata, 1½ uncialia dura, tubus compressus, curvus, 4 lineas latus, marginibus, hispidis, laciniæ recurvæ lanceolatæ, acutæ, postica quam aliæ minor. Tubus corollæ breviter exsertus, pubescens, laciniæ lanceolatæ unguiculatæ subæquales dorso pubescentes. Staminodia lateralia linearia angustissima, labello connata. Labellum oblongum obtusum, carnosulum, concavum, costis duobus elevatis ad apicem. Stamen fertile, oblongum ellipticum obtusum, labello subæquale, loculi lineares approximati. Stylis filiformis gracilis. Stigma hippocreniforme curvum.

Sogere, 3000 ft., Oct. 20, 1885, Nos. 144*a*, 143*b*.

This plant is distinguished at first sight from the preceding by its pubescence, and by the much more recurved points of the bracts. *T. pungens* is entirely glabrous, and the bracts in the dry plant have a polished shining appearance. In *T. pubescens* one of the sepals is distinctly shorter than the others; the petals, too, are apiculate, and hairy on the back, and the stigma is horse-shoe-shaped.

The inflorescence of the genus is described by the authors of the 'Genera Plantarum' as terminal, and in Miquel's figure it is represented so; but in all the specimens brought by Mr. Forbes it appears to have been seated on the rhizome, on a short stout peduncle, after the manner of Zingiber, &c. Possibly it takes on both positions, as does *Costus afer* L.

Curcuma aromatica L.—Flowers bright orange, in purple spathes. Sogere, at 1050 ft., Oct. 1885, No. 244.

Costus speciosus L. — Flowers white. Mt. Korkoko, at 2500 ft., No. 797.

Alpinia nutans L. — Victoria Bay. East Coast of New Guinea, *Barclay*.

Alpinia (§ Hellenia) **affinis**, n. sp.—Herba valida. Foliorum vaginæ costatæ; ligulæ maximæ 5 unciales membranaceæ glabræ (fasciculo parvo pilorum supra petiolum excepto) petiolus validus ½ uncia longa, lamina 17 uncias longa, 2½ uncias lata quo latissima lanceolata, basi angustato cuneato apice acuminato. Panicula pauciramosa ramis pubescentibus. Flores subsecundi biunciales. Calyx 1¼ uncialis tubulosa spathaceo-fissa, lamina obtusa elliptica lorata minute pubescens. Corollæ laciniæ angustæ lanceolatæ acuminatæ quam tubus breviores. Labellum lanceolatum acutum, apice cucullato mucronato acuto. Staminodia lanceolata obtusa quam stamen fertile breviora. Anthera linearis ¼-uncialis connectivo angustissimo. Stylus filiformis gracillimus. Stigma hirsutum clavatum. Ovarium pubescens. Bacca globosa glabra pisi magnitudine breviter pedicellato, pedicello pubescente.

Sogere, Oct. 1885, Nos. 2, 58.

A. (§ Hellenia) **decurva**, n. sp.—Caulis gracilis. Foliorum vaginæ glabræ 2 uncias longæ costatæ, ligulæ membranaceæ brunneæ rotundatæ integræ minute pubescentes. Petiolus 2 lineas longus; lamina glabra lanceolata acuminata acuta 7 uncias longa, 1½ lata. Scapus simplex terminalis gracilis eleganter decurvus, pubescens 7 uncialis, majore parte (ad 5 uncias) nudo apice racemoso. Flores plures aurantiaci 1¾ uncia longi. Calyx tubulosa spathaceo-fissa, lamina integra obtusa lanceolata elliptica 1¼ uncias longa. Corollæ tubus exsertus, laciniæ lanceolatæ loratæ subacutæ, subæquales. Labellum angustum lanceolatum petalis subsimile apice cucullato apiculo minute pubescente. Staminodia angusta lanceolata lorata acuminata undulata. Anthera linearis subsagittata connectivo angustissimo. Filamentum semiunciale angustum complanatum basi dilatatum. Stylus filiformis tenuis. Stigma minimum clavatum. Ovarium pubescens. Capsula glabra elliptica rufa vel aurantiaca in valvis tribus demum fissa. Semina plura nigra, compressa rotundata.

Sogere, at 2000–2500 ft. elevation. Flowers orange or orange-red, bases bright red; Oct. 1885, Nos. 253, 229, 53. In fruit, Nos. 41, 57, 231. Fruit light red or orange-yellow.

Clinogyne grandis Benth. — Bamboo-like shrub. Fruit light green. River-side, Sogere, 1750 ft.

Phrynium, near *P. capitatum*.—Herbaceous shrub. Bracts lake-scarlet. Sogere, No. 326. Flowers too young.

Dioscoreaceæ.

Dioscorea pentaphylla Lam. — Meroka Mountains, at 2500 ft., No. 888.

D. vulgaris Miq. is the only other species yet recorded from New Guinea.

Liliaceæ.

Dracæna angustifolia Roxb. — Flowers pale yellow, No. 754. Fruits bright red, Oct. 1885, No. 274.

Dracæna sp. *?*—Erect shrub. Fruit green to bright red. Sogere, 1800 ft., No. 258. This seems to be a different species, the leaves being much narrower, and the whole plant smaller. It was not obtained in flower, so cannot be identified.

D. Draco L. (introduced ?) is also recorded from the island.

Cordyline terminalis Kunth. — Fruit bright scarlet. Sogere, 1000 ft., No. 18.

Dianella ensifolia Red. — Flowers dark purple-blue. Sogere, at 2000 ft., No. 327.

Smilax leucophylla Blume. — Fruit green. Sogere, at 2500 ft., Nos. 178, 189. There are also two other indeterminable species in fruit in the collection.

Commelinaceæ.

Cyanotis capitata C. B. Clarke. — South Cape, No. 919. The flowers appear, from the dried specimen, to have been blue and yellow.

Flagellariaceæ.

Flagellaria indica L.—Flowers white or greenish white. Riverside, Sogere, at 1750 ft., No. 688. Fruits yellowish white, Sogere, at 2000 ft., No. 19.

Palmæ.

Ptychosperma caryotoides, n. sp. — Palma humilis. Folia circiter bipedales rachis triquetra validula fusco-furfuracea, segmenta alterna cuneata emarginata flabelliformia dentata, subtus pallida circiter 6 uncias longa et ad apices æqui lata. Spatha tenuis membranacea $2\frac{1}{2}$ uncias longa. Spadices breves ramosi 3–4 uncias longi, ramis paucis 5–6, circiter 3 uncias longi. Flores masculi parvi plures arcti. Sepala minima ovata. Petala 3 duplo longiora ovata elliptica obtusa striata. Stamina 13, erecti, filamentis brevibus. Pistilli rudimentum tenue elongatum stylo clavato. Flores feminei, magis dissiti. Petala et sepala brevia obtusa lata ovata imbricata. Drupa $\frac{3}{4}$-uncia longa aurantiaco-coccinea, elliptica oblonga rostrata, stigma terminale. Pericarpium tenue crustaceum, mesocarpium fibrosum, endocarpium osseum ruminatum.

Sogere. Small erect palm; fruit dark scarlet or orange-scarlet, or green. Nos. 93, 166, 307.

P. litigiosa Beccari. — A small palm, with light red drupes with lake cheeks. Sogere, at 2500 ft., No. 72. I have not seen the flowers of this plant, but in other respects it tallies very well with Prof. Beccari's description.

Linospadix Forbesii, n. sp.—Caulis erectus, $\frac{1}{2}$-uncia crassus. Folia circiter pedales, rachis acute angulata, brunneo-furfuracea, segmenta alterna angusta linearia acuminata acuta carinata, 6–9 uncias longa, $\frac{1}{4}$ uncia lata, vagina in fibris fissa. Spathæ non visæ. Spadices gracillimi pedales, rachide brunneo-velutino. Flores masculi parvi $\frac{1}{8}$-uncia longi, 1–2 in utroque cavo. Sepala lata ovata haud imbricata, parva. Petala lanceolata subobtusa obliqua striata multo longiora. Stamina 6 brevia dorsifixa. Pistilli rudimentum minimum conicum cylindricum. Flores feminei; drupa oblonga elliptica rostro brevi, $\frac{3}{8}$-uncia longa in capsula parva.

Pericarpium tenue crustaceum granulosum, aurantiaca rubra. Mesocarpium fibrosum. Endocarpium æquabile corneum durum.

Sogere, at 2500 ft. Flowers green, and fruit orange-red. Nos. 163, 211.

L. flabellatus Beccari. — A small erect shrub, with immature fruit. Sogere, at 2500 ft., No. 235.

The collection contains also a species of *Nenga*, with young male flowers only; and a *Calamus*, near *C. Mishmensis*, from Mt. Wari Wari, at 5000 ft. Flowers whitish yellow. No. 186.

Pandanaceæ.

This order seems to be very well represented in New Guinea, but few species have been sufficiently well collected to be identified or described.

Pandanus latifolius Rumph.—Victoria Bay, *Barclay*.

P. Kurzianus Solms Laub. — A tree 12 ft. high. Fruit-spikes red when ripe. Jobie Island, *Barclay*, No. 4025.

P. ceramicus Kurz.? — A young female spadix of a screw pine sent by Forbes without specific locality, appears to belong to this species.

Freycinetia angustissima, n. sp.— Frutex scandens. Caulis gracilis circiter pedalis. Folia angustissima linearia acuminata acuta 2–2½ uncias longa, ¼-uncia lata marginibus et carina ciliatis, vaginis brevibus teretibus ¼ uncialibus. Bracteæ parvæ lanceolatæ acuminatæ pallidæ marginibus dense ciliatis. Capitula feminea singula vel bina globosa vix ½-uncia longa pedunculata, pedunculis ¼-uncialibus. Pistilla distincta conica, stigmata parva depressa. Semina copiosa, hippocreniformia kermesina, strophiolis pallidis, striolata, in mucilagine immersa. Flores masculi non visi.

Sogere, at 2000 ft., ascending on the stems of trees, No. 3. Allied to *F. angustifolia*, but, besides the narrower leaves, distinguished by the strophioles of the seeds.

F. Forbesii, n. sp.—Caules scandentes validuli. Folia lanceolata striata basi angustata acuminata, apicibus et carina ciliatis, 4–6 uncias longa, ¾–½ lata, vaginis ferme ¾-uncialibus angulatis costis paucis acutis. Bracteæ parvæ ovatæ. Capitula feminea globosa 3–4 in ramo pedicellis ¾-uncialibus validulis. Pistilla monocarpica rarius syncarpica conica. Stigmata ovata rotundata depressa plana lutescentia. Semina kermesina estrophiolata. Fructus coccineus.

Mt. Korkoko, at 2500 ft., January, 1881. Mt. Meroka, No. 352. A large climber, with bright scarlet fruits. Allied to *F. scandens*.

Araceæ.

Epipremnum magnificum Engler. — A climbing shrub. Fruit bright scarlet, orange, or green. Sogere, at 2000 ft., Nos. 128, 828.

Raphidophora Peepla Schott?—Spadix white. Sogere, No. 323.

Naiadaceæ.

Aponogeton crispus Thunb. — In an affluent of the Laragi, Nov. 1885.

Gramineæ.

Leptaspis urceolata R. Br. — Fruit grey. Sogere, at 2000 ft. altitude, No. 160.

Dendrocalamus Forbesii, n. sp. — Caulis validus. Folia glabra, lanceolata, 20 uncias longa, 2 uncias lata, costa ad basin crassa, basi rotundata, petiolata, ligula pectinata. Rami paniculæ longi graciles, duri. Glomeruli plures dissiti (internodiis uncialibus), multispiculati compacti, bracteis deciduis truncatis ad basin. Spiculæ paucifloræ (2–3) lanceolatæ, pallidæ, læves. Rachilla glabra. Glumæ rigidæ obtuse mucronatæ nec carinatæ, marginibus ciliatis. Palea angusta ciliata. Lodiculæ sæpissime nullæ. Stamina brevissime apiculata. Stylus gracillimus simplex vel bifidus ferme glaber. Ovarium (juvene) minute pubescens.

Sogere, at 2500 ft., Oct. 22, 1885, No. 153.

LOCALITIES FOR IRISH HEPATICS AND MOSSES.

By Henry Chichester Hart.

The following mosses and hepatics have been chiefly identified by Mr. Holt, of Manchester, to whom I beg to tender my sincere thanks. Those which have not his name affixed but are marked D. M., were named for me by the late David Moore, in 1878. All the specimens were collected by myself and are still in my possession. They are almost entirely from the mountainous parts of Ireland, and gathered at random from amongst alpine plants, in the hopes of securing a variety, for I am only beginning to become a little familiar with these forms. I have omitted mention of the common species, and with regard to distribution I have been guided by Dr. Moore's papers "On Irish Hepaticæ and Irish Mosses," published in the 'Proceedings of the Royal Irish Academy.' I have also consulted Mr. S. A. Stewart's 'List of the Mosses of the North-east of Ireland,' before including a northern record :—

Hepatics.

Asterella hemisphærica Beauv. Poisoned Glen, Co. Donegal; D.M.

Lepidozia cupressina Sw. Clare Glen, Glenstal, Limerick; Holt.

Bassania triangularis Schl. MacGillicuddy's Reeks, Kerry; Holt. Twelve Bens, Galway; Holt.

Harpanthus scutatus Spruce. Amongst *Bryum hornum*, near Ramelton, Co. Donegal, by the River Lennan; D. M.

Herberta adunca Dicks. Fanet, Co. Donegal; D. M.

Anthelia julacea Linn. Lugnaquilia, Co. Wicklow; Holt.

Scapania undulata Linn., var. *purpurea*. Alt Mountain, near Ardara, Donegal; Holt; and at Glenalla, Rathmullan, Co. Donegal; D. M.

Plagiochila tridenticulata Taylor. Amongst *Bryum hornum*, by the Lennan, near Ramelton, Co. Donegal; D. M.

Blasia pusilla Linn. By the River Suir, near Carrick, Co. Tipperary; Holt.

Metzgeria conjugata Dill. Clare Glen, Glenstal, Limerick; Holt.

Mosses.

Campylopus flexuosus Dill. Mullaghclevaun, Co. Wicklow; Holt.—*C. Schwarzii* Sch. Alt Mount, near Ardara, Co. Donegal; Holt.—*C. longipilus* Bridel. With the last, and at Bulbein Mount, Innishowen; Holt. — *C. setifolius* Wils. North face of Benan, Twelve Bens, Co. Galway; Holt. Slieve Snacht West, Co. Donegal; D. M. — *C. fragilis* Br. & Sch. Glenalla, Co. Donegal; D. M. In fruit.

Racomitrium protensum Al. Braun. Mountains near Ardara, Co. Donegal; Holt.

Anæctangium compactum Schw. Carrablagh, Fanet, Donegal; Holt. Mountain near Ardara, Co. Donegal; Holt. Clare Glen, Glenstal, Limerick; Holt.

Didymodon cylindricus Br. & Sch. Fanet, Co. Donegal; D. M.

Trichostomum littorale Mitten. Ben Evenagh, Derry; Holt. This moss appears to have only a very vague record in the Irish List of Dr. Moore.

Ditrichium homomallum Hampe. Carlingford Mountains, Co. Down; Holt.

Orthotrichum rupestre Schl, Marble Hill, Co. Galway; Holt.—*O. saxatile* Bridel. Killakee, Co. Dublin; Holt.—*O. pulchellum* Sm, Glenalla, Co. Donegal; Holt.

Zygodon Mougeottii Br. & Sch. Twelve Bens, Co. Galway; Holt. Alt Mountain, near Ardara, Co. Donegal; Holt.

Splachnum mnioides Linn. fil. Dooish Mountain, Co. Donegal; Holt

Bryum alpinum Linn. Fanet, Co. Donegal; D. M.—*B. julaceum* Sm. Slieve Snacht West, Co. Donegal; D. M.

Plagiothecum elegans Hooker. Lugnaquilia, Co. Wicklow; Holt. Mourne Mountains; Holt. — *P. denticulatum* Dill. In several places in N.W. Donegal; D. M. Twelve Bens, Galway. Commeragh, Waterford, and MacGillicuddy's Reeks, Kerry; Holt.

Leskea polycarpa Hedw. At the base of Errigal, Co. Donegal; D. M.

Hypnum striatum Schr. Dargle, Co. Wicklow; Holt. — *H. striatulum* Spruce. Clogher Head, Kerry; Holt. — *H. Kneiffii* Schimp. Salt marshes near Inch Road, Lough Swilly, Co. Donegal; Holt. — *H. flagellare* Dicks. Dooish Mountain, Co. Donegal, and Lugnaquilia, Co. Wicklow; Holt.

Fissidens tamarindifolius Turner. Donegal; D. M. The name of the exact locality where I gathered this rare moss in 1878 is unfortunately obliterated, but it was somewhere near Glenalla. It has only been found in one other locality, near Dublin, according to Moore. — *F. osmundioides*. Hedw. Twelve Bens, Connemara; Holt. Ardara, Co. Donegal; Holt.

Pogonatum urnigerum Bridel. Poisoned Glen, Co. Donegal; Holt.

Polytrichum gracile Dicks. Lough Dan, Co. Wicklow; Holt.— *P. juniperinum* Willd. Dooish Mountain, Co. Donegal and Mullaghclevaun, Co. Wicklow; Holt.— *P. alternatum* Menzies. Lough Dan and Ballinacor, Co. Wicklow; Holt.

Diphyscium foliosum Web. et Mohr. MacGillicuddy's Reeks, Co. Kerry; Holt.

THE DISTRIBUTION OF *POTAMOGETON* IN BRITAIN.

By Arthur Bennett, F.L.S.

The following are additions (with a correction) to the list at pp. 139—142. "Sp." means that a specimen exists in my own herbarium. "!" indicates that I have seen a specimen, but do not possess it:—

Potamogeton pectinatus L.

41 Glamorgan. W. R. Linton, sp.
02 Ebudes s. Fingland, sp.

P. flabellatus Bab.

7 Wilts n. Druce in Journ. Bot. 1885, p. 275.
33 Gloster east. Druce in litt.

P. filiformis Nolte.

02 Ebudes south. Fingland, sp.

P. mucronatus "Schrad."

31 Hunts. Fryer, sp.

[*P. acutifolius* Link.

32 Northton. Mr. Druce writes that his record in Journ. Bot. p. 116, was an error,—a slip for *acuminatus*.]

P. zosterifolius Schum.

17 Surrey. Beeby, sp.

P. decipiens Nolte.

23 Oxford. Druce in litt.
81 Berwick. Martyn in Edin. Herb. 1835!

P. nitens Weber.

09 Caithness. F. J. Hanbury, sp.

P. Zizii Roth.

38 Warwick. Kirk, sp. herb.! A. G. More.
74 Wigton. Druce in litt.
81 Berwick. Renton, sp.

P. rufescens Schrad.

23 Oxford. "Beesley," in Fl. Oxf.
49 Carnarvon. J. E. Griffith!

P. natans L. (true).

7 Wilts north. Druce in litt.
72 Dumfries. Dr. Davidson in litt.
95 Elgin. Grant, herb!
02 Ebudes south. Miller, sp.

P. polygonifolius Pourr.

41 Glamorgan. W. R. Linton, sp.

P. plantagineus Du Croz.

22 Berks. Druce, sp.

NOTES ON SOME NORTH WALES PLANTS.

By Rev. W. Moyle Rogers, F.L.S.

(Concluded from p. 343).

Pyrus torminalis Ehrh. D. By the Dee above Llangollen.
Cratægus Oxyacantha L., d. *monogyna* Jacq. Common. — b. *laciniata* Wallr. Rather frequent in the Vale of Llangollen from Trevor Rocks (D.) to Glynydfrdwy (M.)

Saxifraga stellaris L. M. On Manod Mawr, at about 2000 ft. — *S. tridactylites* L. D. Llangollen.

Chrysosplenium oppositifolium L. M. Vale of Festiniog, up to 2000 ft. on Manod Mawr; locally abundant.

Parnassia palustris L. C. Hillside at Roman Bridge.

Cotyledon Umbilicus L. Common.

Sedum Telephium L. Abundant and clearly native on rocky hillsides. D. Trevor Rocks, &c. M. Glyndyfrdwy. Dolgelly neighbourhood.

Drosera rotundifolia L. M. Common. C. Roman Bridge. No other species seen.

Lythrum Salicaria L. Seen only between Dolgelly and Barmouth, and along the coast (M.).

Peplis Portula L. M. By Llyn Cynwch and Cwm Camlan.

Epilobium angustifolium L. M. Thickets near the Cross Foxes Inn. Between Dolgelly and Barmouth. — *E. roseum* Schreb. D. About Llangollen, in plenty. Apparently not hitherto known as a N. Wales plant. — *E. obscurum* Schreb. Common. True *tetragonum* not seen. — *E. palustre* L. M. Between Dolgelly and the Cross Foxes Inn, in plenty. Vale of Festiniog up to Blaenau, and to 2000 ft. on Manod Mawr.

Sium erectum Huds. D. Acrefair Canal.

Scandix Pecten-Veneris L. and *Æthusa Cynapium* L. M. Dolgelly.

Œnanthe Lachenalii Gmel. M. Between Dolgelly and Barmouth, abundant. — *Œ. crocata* L. Frequent. No other species seen.

Silaus pratensis Bess. Seen only at Bala (M.).

Cornus sanguinea L. D. About Llangollen, locally common. Not seen in M.

Viburnum Opulus L. Uncommon. D. Acrefair. M. Between Dolgelly and "The Torrent Walk."

Galium palustre L., b. *elongatum* Presl. C. Near Roman Bridge — c. *Witheringii* Sm. D. By canal, Pentrefelin. M. Dolgelly, &c.

Scabiosa Columbaria L. D. Base of Eglwseg and Trevor Rocks. — *S. arvensis*. D. Frequent. M. Glyndyfrdwy.

Filago minima Fr. D. Near Valle Crucis Abbey. M. Glyndyfrdwy, abundant.

Inula Helenium L. D. Denizen in two or three spots about Llangollen. — *I. Conyza* DC. D. Trevor Rocks.

Pulicaria dysenterica Gaertn. D. Valley between Llangollen and Eglwseg Rocks. Not known for M.

Bidens tripartita L. D. Acrefair Canal, in plenty.

Tanacetum vulgare L. D. Base of Eglwseg Rocks.

Artemisia Absinthium L. Rather frequent in the Vale of Llangollen (D.), and between Dolgelly and Bala (M.).

Carlina vulgaris L. Common

Carduus pycnocephalus Jacq. M. Barmouth.—*C. nutans* L. and *C. crispus* L. Frequent in D, but not seen in M.

Serratula tinctoria L. Local, M. By Cwm Camlan, in great plenty. Tan y Bwlch. C. Roman Bridge. Bettws y Coed.

Hieracium vulgatum Fr. D. Frequent. M. Glyndyfrdwy. Dolgelly. — *H. umbellatum* L. M. Between Dolgelly and Cross Foxes Inn. Between Blaenau and Festiniog. C. Frequent. — *H. boreale* Fr. Remarkably common.

Hypochæris glabra L. M. Glyndyfrdwy, rocky hillside in grassy mossy spots, in fair quantity, 14th August. First record for all Wales, I believe.— *H. radicata* L.—Very common. A dwarf and nearly glabrous form grows with *glabra* at Glyndyfrdwy.

Leontodon hirtus L. and *L. hispidus* L. D. Common. M. Barmouth. — *L. autumnalis* L. Common; ascending to about 2000 ft. on Manod Mawr.

Lactuca muralis Fresen. D. & M. Common. C. Bettws y Coed.

Tragopogon pratensis L. D. Llangollen and Acrefair; the tpye.

Lobelia Dortmanna L. M. Llyn Cynwch, in great quantity.

Jasione montana L. Common.

Wahlenbergia hederacea Reichb. C. Bettws y Coed.

Vaccinium Vitis-Idæa L. M. Top of Manod Mawr.—*V. myrtillus* L. Common. In M. up to top of Manod Mawr.

Anagallis tenella L. M. Tan y Bwlch, &c. Common everywhere.

Menyanthes trifoliata L. M. Llyn Cynwch. Ddualt and Blaenau Festiniog.

Cynoglossum officinale L. D. Pentrefelin. Base of Eglwseg Rocks.

Myosotis cæspitosa Schultz. D. Valle Crucis. M. Near Dolgelly. —*M. palustris* With. D. Acrefair Canal; abundant.—*M. repens* D. Don. M. By Llyn Cynwch. Between Dolgelly and the Cross Foxes Inn. All three species appear to be very local.

Echium vulgare L. D. Pentrefelin. Abundant along the Eglwseg and Trevor Rocks. M. Barmouth. Aberdovey.

Convolvulus arvensis L. Seen only at Tan y Bwlch and Barmouth (M.). No *Cuscuta* seen.

Solanum Dulcamara L. and *Verbascum Thapsus* L. Common; but no other species seen in either genus.

Scrophularia aquatica L. Seen only at Llangollen, by the Dee (D.).—*S. nodosa* L. Common.

Digitalis purpurea L. Remarkably common. Reaching fully 1800 ft. on Manod Mawr.

Veronica hederæfolia L. and *V. montana* L. Found only, in spite of diligent search elsewhere, at Llangollen (D.). — *V. polita* Fr.

This always seems to me rather commoner (and not unfrequently much commoner) than *V. agrestis* L. in S. W. England; but wherever I went in N. Wales *agrestis* was common, while *polita* showed itself only at Dolgelly (M.).—*V. persica* Poir. D. Fairly common. M. Dolgelly. — *V. arvensis*, *serpyllifolia*, *officinalis*, *Chamædrys* and *Beccabunga*; all common.

Pedicularis palustris L. M. Tan y Bwlch. — *P. sylvatica* L. M. Frequent. C. Roman Bridge.

Melampyrum pratense L. D. Between Llangollen and Eglwseg Rocks. M. and C. Frequent; usually with orange-coloured flowers, as in the hillier parts of Devon.

Pinguicula vulgaris L. Common; occupying the ground in which *P. lusitanica* L. is usually seen in S.W. England.

Mentha viridis L. D. Base of Eglwseg Rocks; by running water, away from house and garden.—*M. hirsuta* L. D. and C. Common. M. By Cwm Camlan. — *M. sativa* L. (*rivalis* and *paludosa*). D. Acrefair Canal. M. Dolgelly. — *M. arvensis* L. D. Very common. M. Vale of Festiniog, frequent.

Lycopus europæus L. D. Acrefair Canal. M. Between Dolgelly and Barmouth.

Origanum vulgare L. D. Vale of Llangollen, from Pentrefelin to Trevor Rocks; locally abundant. M. Between Dolgelly and Barmouth.

Thymus Serpyllum Fr. Common. *Chamædrys* not seen.

Calamintha Clinopodium Benth. Remarkably common. The only species seen.

Scutellaria minor L. M. and C. Frequent.

Stachys Betonica Benth. M. and C. Locally abundant. — *S. palustris* L. and *sylvatica* L. Common; a white-flowered variety of *palustris* being exceedingly abundant in Acrefair Canal (D.). — *S. ambigua* Sm. Characteristic and in considerable quantity at Dolgelly.

Galeopsis Ladanum L. and *G. Tetrahit* L. Common. — *G. speciosa* Mill. M. In several spots near Dolgelly, but in small quantity.

Lamium album L. D. Llangollen and Acrefair, in good quantity. Not seen elsewhere. — *L. Galeobdolon* Crantz. D. Common. M. Near Dolgelly. I saw no *Ballota*.

Littorella lacustris L. M. Llyn Cynwch, in plenty.

Chenopodium Bonus-Henricus L. D. In considerable quantity about Llangollen and Valle Crucis. Base of Eglwseg Rocks.

Polygonum lapathifolium L. M. Dolgelly. Blaenau Festiniog.

Rumex Hydrolapathum Huds. D. Acrefair Canal.

Mercurialis annua L. M. Barmouth, very common.

Humulus Lupulus L. D. Llangollen. M. Dolgelly.

Myrica Gale L. M. By Cwm Camlan, in great quantity and very luxuriant. Tan y Bwlch. Blaenau Festiniog, abundant.

Betula alba L. D. Llangollen. M. Glyndyfrdwy.—*B. glutinosa* Fr. M. By Cwm Camlan. C. Common.

Quercus Robur L. — c. *sessiliflora* Salisb. D. Llangollen. M. Glyndyfrdwy. — *Q. pedunculata* Ehrh. Common.

Salix cinerea L. and *S. Caprea* L. Common. — *S. aurita* L. D. Base of Eglwseg Rocks. M. By Cwm Camlan, &c., common. C. Roman Bridge.

Populus tremula L. By Tan y Llyn. Planted ?

Elodea canadensis Mich. D. Llangollen. Acrefair Canal.

Tamus communis L. D. Common. C. Roman Bridge.

Narthecium ossifragum Huds. M. Locally abundant. C. Roman Bridge.

Juncus squarrosus L. M. Exceedingly common; reaching top of Manod Mawr. C. Roman Bridge.—*J. glaucus* Ehrh. D. Base of Eglwseg Rocks. M. Near Dolgelly. — *J. acutus* L. M. Barmouth, but apparently in no great quantity. — *J. supinus* Mœnch. D. Base of Eglwseg Rocks. M. Very common. C. Roman Bridge.

Luzula maxima DC. D. By the Dee. M. Moel Cynwch. C. Bettws y Coed. — *L. congesta* Koch. M. Blaenau Festiniog. Probably common enough earlier in the season.

Typha latifolia L. M. Between Dolgelly and Barmouth, in great quantity.

Sparganium ramosum Curt. (Aggregate). D. Valle Crucis Abbey fishpond.—*S. simplex* Huds. D. Acrefair.

Lemna minor L. Apparently uncommon. D. Llangollen. Acrefair. M. Dolgelly. The only species seen.

Elisma natans Buchenau. M. Llyn Cynwch; in plenty.

Potamogeton natans L. M. Llyn Cynwch.—*R. polygonifolius* Pour. D. Acrefair Canal. M. Vale of Festiniog. — *P. crispus* L. D. Llangollen Canal.

Eleocharis palustris R. Br. D. In the Dee at Llangollen. M. Lyn Cynwch. — *E. multicaulis* Sm. C. Roman Bridge.

Scirpus cæspitosus L. M. Vale of Festiniog, abundant. C. Roman Bridge.—*S. setaceus* L. M. With the last.—*S. lacustris* L. (Aggregate). M. Llyn Cynwch. Llyn Mair. — *G. maritimus* L. M. Near Barmouth.

Eriophorum vaginatum L. Moel Cynwch. Blaenau Festiniog (with *E. angustifolium* Roth.).

Rhynchospora alba Vahl. C. Roman Bridge.

Carex pulicaris L. M. Festiniog. — *C. arenaria* L. M. Barmouth. — *C. vulpina* L. D. Acrefair Canal. — *C. muricata* L. D. Vale of Llangollen and base of Eglwseg Rocks, frequent. *C. echinata* Murr. M. Common; reaching top of Manod Mawr. — *C. remota* L. D. Llangollen. Valle Crucis. M. Dolgelly. — *C. ovalis* Good. M. Vale of Festiniog, frequent. C. Bettws y Coed. —*C. Goodenowii* J. Gay. M. Dolgelly and Blaenau Festiniog. — *C. glauca* Murr. and *C. panicea* L. Common. — *C. pallescens* L. M. Dolgelly. C. Roman Bridge. — *C. sylvatica* Huds. C. Bettws y Coed. — *C. binervis* Sm. M. Vale of Festiniog, frequent. — *C. fulva* Good. C. Roman Bridge.—*C. flava* L. (Aggregate). Common; chiefly b. *minor* Towns., but *eu-flava* (I believe) at base of Eglwseg Rocks (limestone).—*C. hirta* L. Seen only at Acrefair (D.). — *C. vesicaria* L. M. Valle Crucis Abbey fishpond.

Alopecurus fulvus Sm. D. Acrefair Canal.

Aira caryophyllea L. and *A. præcox* L. M. Glyndyfrdwy.

Holcus mollis L. M. Dolgelly, &c. Like the last two, really common everywhere.

Trisetum flavescens Beauv. D. Common. M. Barmouth. Festiniog.

Phragmites communis Trin. M. Dolgelly and by the coast; locally very abundant.

Melica uniflora Retz. D. Vale of Llangollen, frequent. M. Dolgelly. C. Bettws y Coed.

Briza media L. D. Base of Eglwseg Rocks.

Poa nemoralis L. M. Glyndyfrdwy, among rocks on hillside, in plenty.

Glyceria fluitans R. Br. D. and M. Only moderately common. — *G. plicata* Fr. C. Bettws y Coed. — b. *pedicillata* Towns. M. Llyn Cynwch. Blaenau Festiniog.

Festuca rigida Kunth. D. Common.—*F. myurus* L. D. Acrefair. — *F. sciuroides* Roth. D. and M. Common. — *F. elatior* L. D. By the Dee, Llangollen.

Bromus giganteus L. Very abundant by the Dee (D.), and at Dolgelly (M.). C. Bettws y Coed. — *B. asper* Murr. D. Very common. Not seen in M.—*B. sterilis* L. Local. D. Llangollen. Acrefair. M. Near Dolgelly.

Brachypodium sylvaticum Roem. et Schult. M. By Cwm Camlan, &c.; abundant. D. and C. Common.

Agropyron caninum Beauv. D. Abundant by the Dee. C. Bettws y Coed.—*A. junceum* Beauv. and *Hordeum murinum* L. M. Barmouth.

Lomaria Spicant Desv. M. Exceedingly common. C. Roman Bridge.

Asplenium Adiantum-nigrum L. M. Glyndyfrdwy. Dolgelly. — *A. Trichomanes* L. Locally abundant. M. Glyndyfrdwy. Between Dolgelly and the Cross Foxes Inn. Maentwrog. C. Bettws y Coed.—*A. Ruta-muraria* L. Very common, especially at Dolgelly.

Athyrium Filix-fœmina Roth. Very common everywhere.

Scolopendrium vulgare Symons. Rare. D. Base of Eglwseg Rocks. I searched in vain for *Polysticha*, only seeing a little *P. angulare* Presl. in a fern dealer's hands at Bettws y Coed (C.).

Lastræa Oreopteris Presl. M. By Cwm Camlan. Vale of Festiniog, up to Blaenau, frequent. C. Roman Bridge.—*L. Filix-mas* Presl. Common. — c. *paleacea* Moore. M. Moel Cynwch. Bwlch Llyn Bach. Vale of Festiniog. Locally abundant. — *L. spinulosa* Presl. C. Heathland near Roman Bridge. — *L. dilatata* Presl. Fairly common; reaching top of Manod Mawr.

Phegopteris Dryopteris Fée. D. Hillside west of Geraint's Hill, among slaty shingle at about 600 ft., in great quantity.

Equisetum arvense L. M. Glyndyfrdwy, &c. Common. — *E. limosum* Sm. M. Llyn Cynwch.

Lycopodium Selago L., *L. clavatum* L., and *L. alpinum* L. Moel Cynwch and Manod Mawr (to the top); abundant. — *L. inundatum* L. M. Blaenau Festiniog.

Since the first part of this paper was printed I have had the benefit of Prof. Babington's opinion on the more critical of my N. Wales Rubi. I am thus enabled to add to my list the following:—On one of the most frequent plants at Blaenau, Festiniog (among slaty rocks), his note is, "It seems to be *R. podophyllus* M., a plant in my opinion closely allied to *R. carpinifolius*. See Genev. p. 129." Of another, from the Vale of Festiniog, which I had labelled "*R. Schlectendalii ?*," he says, "This tends to show me that we rightly continue *macrophyllus* and *Schlectendalii* = *piletostachys*." On the label of a very prickly plant common about Dolgelly he writes, "I have placed specimens closely resembling this under *infestus*"; and on another from Geraint Hill, Llangollen, "I think that this is *mutabilis*." Three more that he annotates are included in the foregoing paper, as follows;—(1) "*R. nitidus ?*. Festiniog Waterfall"; "I think *lentiginosus*." (2) The prickly plant, "hills N.W. of Valle Crucis Abbey"; "*Lentiginosus* apparently. Very like the original specimen from Lees." (3) "*R. hirtus ?*. Roman Bridge"; "I think it is *dentatus* of Bloxam."

NEW RECORDS FOR GLOUCESTER AND MONMOUTH.

By the Rev. H. P. Reader, M.A.

The following plants, which I have met with in Gloucester E. & W. (33, 34) and Monmouth (35) during the last few years, have not hitherto been recorded from those counties:—

Ranunculus trichophyllus Chaix. Several ponds near Woodchester. 34.

Helleborus fœtidus L. Common in beech woods. 34.

Papaver dubium L., b. *Lecoqii* Lam. Occasionally about Stroud, but not persistent. 34.

Cardamine amara L. By Thames and Severn Canal, near Stonehouse. 34.

Sisymbrium Thaliana Hook. Roadside between Usk and Abergavenny, near Clytha House. Mon. 35

Barbarea stricta Andrz. Sharpness Docks. 34.

Polygala vulgaris L. Woodchester. 34. — *P. calcarea* F. Sch. Rodborough. 34.

Silene noctiflora L. Cornfields, Nymphsfield. 34.

Sagina nodosa E. Mey. Cleeve Hill. 33.

Spergula arvensis L. Fields about Clytha House. Mon. 35.

Lepigonum salinum Fr., c. *neglectum* Kindb. — *L. marginatum* Koch. By Severn near Sharpness. 34.

Hypericum Androsæmum L. Pitchcombe. 33.

Medicago denticulata Willd. Roadside between Stroud and Woodchester, 1881. 34. Not persistent, and probably introduced.

Vicia sylvatica L. Tintern. 34.

Prunus insititia L. Near Woodchester. 34. — *P. avium* L. Woods near Woodchester. 34. Very probably planted.

Geum rivale L. Canal-bank, Brimscombe. 34.

Rubus Babingtonii Salt. Open places in woods, Woodchester. 34.

Rosa mollis Sm., b. *cærulea*. Woods near Usk. Mon. 35.

Alchemilla vulgaris L. Woodchester. 34.

Epilobium obscurum Schreb. Frequent in 34. — *E. tetragonum* L. Much less common.

Hippuris vulgaris L. Ponds near Woodchester. 34.

Ceratophyllum "aquaticum." Ditches, Shepherd's Patch. 34.

Apium inundatum Reich. Canal near Coates. 34.

Taraxacum officinale Web., b. *erythrospermum* Andrz. Woodchester. 34. — c. *palustre* DC. Woodchester. 34.

Arctium majus Schk. Railway-bank near Notgrove. 33. Woodchester, Slimbridge, Nymphsfield, &c. 34. — *A. intermedium* Lange. Woodchester. 34.

Cnicus eriophorus Hoffm. Woodchester. 34. — *C. pratensis* Willd. By Windrush, near Bourton. 33.

Bidens cernua L. By canal, Llantarnam. Mon. 35. — *B. tripartita* L. With preceding.

Gnaphalium sylvaticum L. Woodchester. 34.

Anthemis arvensis L. Woodchester. 34.

Campanula Trachelium L. Frequent in 34, as also *C. glomerata* L.

Specularia hybrida DC. Cornfields, Woodchester. 34.

Hypopithys multiflora Scop. Beech woods near Stroud. 34.

Solanum nigrum L. Near Chepstow, Mon. 35.

Orobanche minor Sm. Clover-fields. 33 & 34.

Scutellaria minor L. Near Littledean. 34.

Chenopodium polyspermum L. Dunghills, Slimbridge. 34. — *C. ficifolium* Sm. With preceding.

Atriplex patula L., b. *erecta* Huds. Woodchester. 34.

Beta maritima L. By Severn near Sharpness. 34.

Polygonum aviculare L. The aggregate unrecorded for Monmouth (35). It is doubtless abundant there. I have observed the forms *rurivagum* Jord. and *agrestinum* Jord. near Usk.

Rumex Hydrolapathum Huds., b. *latifolia* Borr. Supposing this to be the same as *R. maximus* Schreb. I record it with some doubt from the Berkeley Canal, near Shepherd's Patch. My plant has obliquely cordate leaves, and raised edges to petioles, but does not otherwise differ from *R. Hydrolapathum*.

Daphne Laureola L. Beech woods, Woodchester, &c. 34.

Epipactis latifolia. Frequent in 34.—*E. purpurata* Sm. Woodchester. 34.

Cephalanthera pallens Rich. 34. Frequent. — *C. ensifolia* Rich. Woods below Wynd Cliff. Mon. 35, 1882.

Habenaria chloroleuca Rid. Woods about Woodchester. 34.

Iris fœtidissima L. Tintern. 34.

Alisma ranunculoides L. Thames and Severn Canal, near Coates. 33 & 34.

Potamogeton natans L. Clytha. Mon. 35. Very common in 33 & 34, to apparent exclusion of *polygonifolius* Pour.

Acorus Calamus L. Berkeley Canal, from near Sharpness onwards for some miles. 34.

Sparganium ramosum Curt. Frequent. 33 & 34.

Juncus diffusus Hoppe. Damp woods, Woodchester. 34.—*J. compressus* Jacq. Pitchcombe Mill. 33.

Scirpus pauciflorus Lightf. By Windrush, between Notgrove and Bourton. 33.

Carex ovalis Good. Near Clytha. 35.—*C. paniculata* L. By Frome, Inchbrook. 34.—*C. pallescens* L. Woodchester. 34.

Melica nutans L. Tintern. 34.

Glyceria plicata Fr. Woodchester. 34.

Festuca Myurus L. By railway, Pempergwm. Mon. 35.

Lycopodium clavatum L. Woodchester. 34.—*L. complanatum* L. Woodchester. 34 (erroneously as from Glos. E. 33. Top. Bot. 1883, p. 527).

NOTES ON THE FLORA OF NORTHAMPTONSHIRE.

By G. Claridge Druce, F.L.S.

In this Journal for 1880 I published a list of Northamptonshire plants,—the result of six years' investigation,—the greater part of which were additions to the first edition of 'Topographical Botany.'

During the six years which have since elapsed I have paid occasional visits to my native county, while some members of the local Natural History Society, notably Messrs. H. N. Dixon, C. Crick, and R. Rogers, have been busy investigating the county flora. The results I now subjoin.

Before giving the list of additional records to the list which has already appeared in the Journal, I send a brief summary of the plants recorded as occurring in the county, but which are not included in the second edition of Top. Bot., although given in the list referred to, and in some cases included in the 'Report of Record Club,' 1878—1885. Only additional localities to those given in Journ. Bot. are now inserted.

Myosurus minimus L. Near Kettering (Gotch), Nene *c.*

Ranunculus Drouetii F. Schultz.—*R. penicillatus* Dumort. Aynhoe, Cherwell; Croyland, Welland.

Diplotaxis muralis DC. Rail-side near Peterborough. Nene *c.* (and in Hunts), with the var. *Babingtonii*.

Cardamine flexuosa With. Wakefield, Ouse. King Sutton, Cherwell.

Viola permixta Jord. *Fide* G. Nicholson.

Polygala vulgaris L.

Sagina ciliata Fries.

Arenaria serpyllifolia L. var. *leptoclados* Guss. Aynhoe, Cherwell. Wittering. Nene *c.*

Cerastium semidecandrum L.
Linum angustifolium Huds. Brackley (H. Blaby). Ouse.
Trifolium scabrum L. —*T. dubium* Sibth.
Vicia angustifolia Reich. Helpstone, Welland.
Prunus insititia L. King's Sutton, Cherwell.—*P. Cerasus* L.
Potentilla procumbens Sibth. Whittlebury Forest. Ouse. — *P. palustris* Scop.

Rubus rhamnifolius W. & N.—*R. leucostachys* Sm. King's Sutton, Cherwell. — *R. echinatus* Lindl. Whittlebury Forest. Ouse.—*R. Radula* Weihe. — *R. Koehleri* Weihe. King's Sutton, Cherwell.—Var. *pallidus* Bab. Whittlebury Forest. Ouse. — *R. amplificatus* Lees. Wakefield. Ouse. — *R. diversifolius* Lindl. — *R. corylifolius* Sm. — Var. *conjungens* Bab. Aynhoe. Cherwell. — Var. *sublustris* Lees. Croughton. Ouse. — *R. althæifolius* Host. Grimsbury (A. French). Cherwell.

Pyrus Aria L. Not native.
Epilobium tetragonum L. Below Peterborough. Nene *c.*
Œnanthe peucedanifolia Poll. (Beesley and French). I have not seen specimens.

Galium palustre L. — Var. *Witheringii* Sm. — *G. erectum* Huds. Locality near Potters Pury destroyed.
Valeriana officinalis L.—Var. *Mikanii* Wats. Aynhoe, Cherwell.
Hieracium vulgatum Fries.
Arctium majus Schk. Castle Ashby, Nene *c.* Peterborough, Nene *c.* Rockingham. Welland. Greatworthy. Cherwell.
Bidens cernua L. Habitat near Northampton, now destroyed.
Artemisia Absinthium L.
Cuscuta Epithymum Murray. Corby (Lewin). Nene *c.* Southorpe (Jones) Welland.
Hypopithys multiflora Scop.
Antirrhinum Orontium L. Little better than a casual.
Mentha piperita Huds. Near Helmdon (Blaby). Ouse.
Lamium hybridum Vill.
Atriplex patula L.—Var. *erecta* Huds.
Polygonatum maculatum Trimen & Dyer. Abundant by river-side below Peterborough. Nene C. Near King's Sutton, Cherwell.
Rumex sanguineus L. — Var. *viridis* Sibth. Delapre. Nene *c.* Bedford purlieus. Nene *c.*
Mercurialis annua L. Little better than a casual.
Salix pentandra L. Marshy place on Wittering Heath, where it may be native. — *S. fragilis* L. Peterborough. Nene *c.* Wartworth. Cherwell. — *S. aurita* L. Bedford Purlieus. Nene *c.*
Orchis incarnata L.
Polygonatum multiflorum All. Near Radstone. Ouse.
Potamogeton pusillus L. Cherwell.
Luzula maxima DC.
Carex Pseudo-cyperus L. — *C. rostrata* Stokes. Wittering. Nene *c.* —*C. vesicaria* L.
Agrostis canina L. Aynhoe. Cherwell.
Kœleria cristata Pers. King's Sutton. Cherwell.
Glyceria plicata Fries. Aynhoe. Cherwell.— *G. distans* Wahl.

Festuca pratensis Huds.

Bromus erectus Huds. Common about Wakerley and Colley-weston. Welland. Barnack and Wittering. Nene *c*.

Hordeum sylvaticum Huds.

Polystichum angulare Presl.

The following plants, given without personal authority for Northamptonshire in edition 2 of Top. Bot., I have found in the county :—

Nuphar luteum Sm. Common in all the districts.

Cardamine amara L. Cherwell, Ouse, and Nene Valley.

Helianthemum Chamæcistus Mill. Local. Abundant on oolite and Barnack rag. Ouse, Nene, and Welland. Absent for some distance from Northampton.

Arabis hirsuta L. Restricted to the north-eastern side of the county, about Barnack, in the Welland and Nene drainage.

Cerastium quaternellum Fenzl. Harleston Firs. Nene *a*.

Hypericum humifusum L. Local. Ouse, Nene, and Welland.

Geranium pusillum Burm. Ouse, Nene, and Welland.

Trifolium striatum L. Rare. Nene.

Ornithopus perpusillus L. Rare. Harleston Firs. Nene.

Rosa rubiginosa L.

Alchemilla vulgaris L. Cherwell. Ouse, Nene, and Welland.

Lactuca muralis Fries. Rare. Cherwell, Nene.

Erigeron acre L. Cherwell, Nene, Welland.

Inula Conyza DC. Local. Cherwell, Ouse, Nene and Welland.

Campanula glomerata L. Cherwell, Ouse, Nene and Welland.

Gentiana Amarella L. Cherwell, Ouse, Nene and Welland.

Verbascum nigrum L. Nene. Almost entirely on the eastern side of the county about Wittering.

Verbena officinalis L. Ouse, Nene, Welland.

Salvia Verbenaca L. Cherwell, Ouse, Nene, Welland.

Origanum vulgare L. Almost restricted to the north-east side of the county in Nene and Welland districts.

Mentha Pulegium L. Nene. Harleston.

Lithospermum officinale L. Ouse, Nene, Welland.

Chenopodium Vulvaria L. Rare. Nene.

Ophrys apifera Huds. Nene, Welland.

Allium vineale L. Ouse, Nene.

Zannichellia palustris L. Nene, Cherwell.

Avena pubescens Huds. Ouse, Nene, Welland.

Lastrea spinulosa Presl. Nene.

Extinctions.

The following plants recorded in Top. Bot., principally on the authority of 'Morton's History,' 1712, are now, I am afraid, lost to the county :—

Ranunculus sardous Cr. Last record, 1845.

Drosera rotundifolia L. Apparently absent from the few remaining marshes in the county. Future editions of Top. Bot. should give the tabular distribution of the plant, as drainage has

extirpated it from most of its Midland haunts. It is extinct in Oxon.

Teesdalia nudicaulis Br. Morton, 1712; last record. It occurs in Warwick, near to the county boundary.

Diplotaxis tenuifolia DC. With the destruction of the Castle, to make way for the railway-station at Northampton, this plant, which formerly abounded on the walls, has been lost from its only habitat.

Sagina subulata Presl., was almost certainly an error.

Teucrium Scordium L. The fen reclamation has, I am afraid, utterly extirpated this plant.

Stratiotes aloides L. Now absent from the fen ditches.

Osmunda regalis L. Long ago extinct.

Pilularia globulifera L. The drainage of the fens has destroyed this plant. The district over which the cotton-grass once waved its plumes is now an extent of arable land, most distressingly clear from weeds.

In addition to these losses, the following plants, it is sadly to be feared, are destroyed. At any rate, recent verification is desirable:—

Lythrum Hyssopifolia L.
Eryngium campestre L.
Centaurea Calcitrapa L.
Carduus tenuiflorus Curt.
Limnanthemum peltatum Gmel.
Cynoglossum montanum Lam.
Ajuga Chamæpitys Schreb.
Juniperus communis L.
Lastrea Oreopteris Presl.

Against these losses we may place the new discoveries made since 1880. Some of these have already appeared in the Journal, or in the Reports of the Record Club, or in the Flora of the county which is being printed in the 'Transactions of the Northamptonshire Natural History Society.'

Ranunculus peltatus Fries. Aynhoe. Cherwell; Bradland Pond, Ouse; Garton, Foster's Booth, Nene *a*, Geddington, Nene *b*. Peterborough, Nene *c*. Stamford, Welland.

Thalictrum flavum L. var. *Morisonii* Gmel. This appears to be the more frequent *Thalictrum* of the Nene Valley. I do not know why it has been omitted in the new edition of the 'London Catalogue.'

Caltha palustris L. var. *Guerangerii* Boreau. Astrop, Cherwell (Beesley).

Helleborus fœtidus L. Bracketed in Top. Bot.; might at least be considered a denizen in the woodland district of the north-east. It was first recorded for the county in Parkinson's 'Paradisus.' — *H. viridis* L. Guilsborough (Hichens). Upton, Welton, Nene *a*. Cogenhoe, Nene *b*. Benefield, Nene *c*. Whittlebury Forest, Ouse.

**Delphinium Ajacis* Reich. Cornfields between Brackley and Hulse (Blaby). Ouse.

Erophila præcox DC. Cosgrove, Ouse, 1880. Kingsthorpe, 1880, Nene *a*. Great Houghton, H. N. Dixon, 1884, Nene *b*.

Brassica nigra Koch. Scattered through all the districts.

**Lepidium ruderale* L. Waste ground, Brackley (Blaby).

Hypericum perforatum L. var. *angustifolium* Gaud. Frequent about Wakerley. Welland.

**Geranium sanguineum* L. Steane Park, Ouse.

Vicia gracilis Lois. King's Cliff, Nene *c*.

Lathyrus montanus Bernh., 1810 (*Orobus tuberosus* L.). Accidentally omitted from ed. 2. It is inserted in ed. 1. Stowe Wood. Bradley Wood. Farthingstone Castle dykes. Nene *a*. Staverton Wood, Avon. Wapperham. Whistley Wood, Ouse. Apparently restricted to the west of the county, but will probably be found in the Bedford Purlieus.

Rosa systyla Bast. Nethercote Lane (Beesley).

**Pyrus Aucuparia* Gaert. Cherwell. Harleston Firs, Nene *a*. Probably planted.

Rubus Balfourianus Blox. Near Banbury. Cherwell.—*R. tuberculatus* Bab. King's Sutton. Cherwell.

Epilobium angustifolium L. Brackley. Ouse. — *E. palustre* L. Wittering. Nene *c*. Brackley Gorse. Ouse (Blaby).

Callitriche obtusangula Le Gall. Castlethorpe. Ouse. Wansford (Crick. Borough Fen. Nene *c*. Croyland, Welland.

Galium palustre L. var. *elongatum* Presl. Rush Mills. Nene *b*. Thorp. Nene *c*.

**Doronicum Pardalianches* L. Courteenhall (Sir H. Wake). East Haddon, Nene *a*. Cransley, Nene *b*.

Taraxacum officinalis Web. var. *erythrospermum* Andrz. Duston. Harleston, Nene *a*. Castle Ashby, Rogers, Nene *b*.—Var. *lævigatum* DC. Kingsthorpe, Duston, Nene *a*. Castle Ashby (Rogers), Nene *b*.—Var. *palustre* DC. Foxhall, Nene *b*. Wittering, Nene *c*.

**Crepis setosa* Hall, fil. Banbury (French).

Erica Tetralix L. Harleston (Loveday)! Nene *a*.

Erythræa pulchella Fries. Newbottle (French). Cherwell. Bedford Purlieus (Jones). Peterborough (Paley), Nene *c*.

**Verbascum virgatum* With. Harleston, Nene *a*.

Galeopsis Tetrahit L. var. *bifida* Böenn. Brackley, Ouse.

Salvia pratensis L. In an old pasture, Yardley Gobion, Ouse.

Pinguicula vulgaris L. Not extinct; still at Foxhall, Nene *b*. Wittering, &c., Nene *c*.

Rumex acutus L. Between Wakerley and Duddington. Welland.

**Urtica pilulifera* L. Irchester, Rev. Slater, Nene *b*. — Var. *Dodartii* Lam. Kettering (Lewin), Nene *b*.

Euphorbia Lathyris L. Bedford Purlieus. Nene, Wakerley and Welland. Native.

Ulmus montana Sm. Wild or naturalized in all the districts.

Salix Smithiana Willd. Harleston. Nene *a*. Peterborough, Nene *c*.

Betula alba L. Doubtful native. Avon, Ouse, Nene and Welland districts.

Populus tremula L. Native. Cherwell, Ouse and Nene.—Var. *glabra* Syme. Coursteenhall, Nene *a*.

Sparganium neglectum Beeby. Ouse. Yardley. — *S. ramosum* Curt. Cherwell, Nene and Ouse.

Potamogeton flabellatus Bab. Nene, Ouse and Cherwell. — *P. zosteræfolius* Schum. Canal, Cosgrove, Ouse. — *P. decipiens* Nolte. Drayton Reservoir, Nene *a*. — *R. lucens* L. var. *acuminatus* Schum. Drayton Reservoir, Nene *a*. By a clerical error this was recorded in the former list as "*P. acutifolius* Schum."

Zannichellia macrostemon Gay. Yardley Gobion, Ouse.

Orchis latifolia × *maculata*. Wittering Heath, Nene *c*.

**Ornithogalum nutans* L. Between Guilsborough and Holywell, Nene *a*. (Rev. T. Hichens).

Scirpus pauciflorus Lightf. Southorpe, Nene *c*. — *S. setaceus* L. Southorpe, Nene *c*.

Carex dioica L. Wittering Marsh (Rev. H. Reader). Southorpe Marsh, Nene *c*. — *C. acuta* L. var. *gracilescens* Almq. Wittering, Nene *c*.— *C. stricta* Good. Very rare. Wittering, Nene *c*.

Setaria viridis* Beauv. Nene banks. Northampton.—S. glauca* Beauv. Nene banks (H. N. Dixon). — **Anthoxanthum Puelii* Lec. et Lam. Harleston (H. N. Dixon).—**Polypogon monspeliensis* Desf. Nene banks, Northampton.

Agrostis nigra With. Kingsthorpe, Nene *a*. Yardley Gobion. Ouse.

Melica nutans Linn. Bedford Purlieus—1878, G. C. D.; 1885, C. Crick.

I collected specimens of this in 1878, but they were unfortunately mixed with some other species, so I hesitated to record it until substantiated. It is an interesting extension of its range.

Lycopodium clavatum L. This, another very interesting addition to the Flora, has been already recorded by Mr. H. N. Dixon (Journ. Bot.), who found it in Harleston Firs, Nene *a*, where I had repeatedly searched for it.

Phegopteris calcarea Fée. Recently recorded in Journ. Bot. by Mr. Dixon. I can scarcely consider it native on the made wall of the rail-side where it occurs, and where I think I should have noticed it had it occurred there during my residence in the county. Nor previous to the rail-cutting being made do I see any locality for it, unless the woodland district of Whittlebury once extended as far east. *Gagea fascicularis* Salisb., indeed, occurs within half a mile of it, and the hedgerows about yield *Adoxa*.

Nitella opaca Agardh. Wittering mill-stream, Nene *c*.

Tolypella intricata Leonh. Yardley Gobion, Ouse, 1879. Not since seen.

Chara fragilis Desv. Yardley, Ouse. Peterborough, Nene *c*.— *C. contraria* Kuetz. Peterborough, Nene *c*.— *C. hispida* L. Abingdon pond, Nene *c*. — *C. vulgaris* L. Nene, Ouse, Cherwell. — Var. *longibracteata* Kuetz. King's Sutton, Cherwell.

NEW RECORDS.

By the Rev. W. R. Linton.

The following are not mentioned in the 2nd edition of 'Topographical Botany,' and so far as I know have not been recorded since its publication :—

Vice-Co. 18. S. Essex.—*Hypochæris glabra* L., at West Tilbury, in grass field on sandy gravel.

Co. 21. Middlesex. — *Valerianella carinata* Lois., by pathway through cultivated fields north of Harefield, east of canal.

Vice-Co. 27. E. Norfolk.—*Juncus diffusus* Hoppe, one patch in meadows near Bradfield, among *J. glaucus* and *J. effusus*.

Co. 31. Hunts.—*Papaver dubium* L. b. *Lecoqii* Lamot., fairly plentiful in two or three places about Buckden. *Prunus Avium* L., in hedges at Graffham, Brampton, and Offord, west of the river. *Saxifraga granulata* L., discovered at Stirtloe, Buckden, by John Linton, Esq. *Valerianella Auricula* DC., at Southoe and Hail Weston, plentiful. *V. dentata* Poll. b. *mixta* Dufr., in the same localities. *Erythræa pulchella* Fr., on clayey slopes near Perry and Graffham. *Lamium purpureum* L. b. *decipiens* Sond. In considerable quantity near Ramsey, by the side of the dyke north of Bodsey Toll; also on cultivated ground at Holme Fen, *Atriplex patula* b. *erecta* Huds., on the east side of the river below Buckden Station. *Sparganium neglectum* Beeby, plentiful at a pond between Southoe and Paxton Wood. This was named for me by Mr. Beeby.

Besides the above new records for Co. 31, I have noticed during the past season the following in new localities :—*Filago apiculata* G. E. Sm., in sandy field N.E. from Buckon. *Serratula tinctoria* L., railway bank by Abbott's Ripton Station. *Juncus diffusus* Hoppe, by Calfer Wood, near Graffham. This last occurred as one patch among abundant *J. glaucus* Ehrh. and *J. effusus* L., and agreed in every point with the description in Prof. Babington's Manual.

Co. 41. Glamorganshire. — *Aconitum Napellus* L. This is spoken of in Top. Bot. as "reported" from Co. 41. I saw several plants from the train along the banks of the Ely, where it runs by the side of the railway. Until some one can secure a specimen it must still, I suppose, continue to be only "reported" from this county. *Viola Curtisii* Forst., in great quantity at one place in the sand dunes E. of Briton Ferry Road Station. *Rubus Idæus* L., a small three-leaved form in same locality, extensively spread and in great quantity over the sandy flats near the sea. *Salix stipularis* Sm., near the canal, Crymlyn Burrows; three bushes observed, but whether introduced or not I could not determine. *Iris Pseudacorus* L. b. *acoriformis* Bor., same locality. *Juncus supinus* Mœnch. b. *Kochii* Syme. Doubtfully recorded in 1885 by Rev. E. F. Linton. Plants found in fruit in July of this year on Fairwood Common, near Swansea, remove all uncertainty. *J. acutiflorus* Ehrh., near Clyne Moor, W. of Swansea. *Potamo-*

geton polygonifolius Pour., very plentiful on Fairwood Common and other places in the neighbourhood of Swansea. On a form growing in deep water Mr. A. Bennett remarked, "approaching *pseudo-fluitans* Syme, but not it." *P. pectinatus* L., a slender form in the canal by Crymlyn Burrows. *Carex flava* L., Crymlyn Burrows. *C. fulva* Good., near Clyne Moor, W. of Swansea. *Equisetum limosum* Sm. b. *fluviatile* L., plentiful along the canal by Crymlyn Burrows. *E. variegatum* Schleich a. *arenarium* Newm., in enormous quantity, filling the ditches on both sides of the railway, Crymlyn Burrows; in April and July alike this plant was growing luxuriantly and fruiting very freely. *Chara vulgaris* L., Crymlyn Burrows. *Tolypella glomerata* Leonh., same locality. *Nitella opaca* Agardh? Clyne Moor. These last three were submitted to Mr. H. Groves; as the *Nitella* was barren he hesitated to name it with absolute certainty, though considering it to be almost undoubtedly as named above.

Vice-Co. 108. W. Sutherland.—*Carex pauciflora* Lightf., Ben Hope, alt. circa 2000 ft.

Co. 109. Caithness.—*Arctium nemorosum* Lej., among the sand-hills, Reay, several plants. This has been seen by Mr. Beeby, who considered it was correctly named.

Co. 111. Orkney Is.—*Juncus supinus* Mœnch b. *Kochii* Syme, at Maes Howe, near Kirkwall, plentiful.

Co. 112. Shetland Is.—*Ranunculus acris* L., apparently b. *tomophyllus* Jord., plentiful on sandy flats of Balta Island, adjoining the sea. *Epilobium angustifolium* L. b. *brachycarpum* Leight., cliffs W. side of Burrafirth, Unst. I suppose introduced. *Juncus supinus* Mœnch. b. *Kochii* Syme, slopes of Saxaford, Unst; very well defined.

ON *SPARGANIUM NEGLECTUM*.

By W. H. Beeby.

Since my last notes on this subject (*ante*, p. 142), I have made a few observations which may be worth recording. In the autumn of 1885 I planted, at Reigate, roots of *S. ramosum* and *S. neglectum* in the same large pot, keeping it immersed in a deep vessel of water. On seeing the young growth of the plants side by side for the first time last spring, I was struck with the very different habit shown at this early period of growth—more different, indeed, than is often apparent in two allied monocotyledons. Besides the previously noted difference in colour, which will probably be found to obtain wherever the plants grow under the same conditions, the following distinctions were noted. In *S. ramosum* the leaves are quite erect (so much so that the tips of the leaves are close together and point skywards), are slightly twisted, almost parallel-sided, and have a broadly rounded apex; in *S. neglectum* the leaves spread horizontally almost from their origin, and are pen-

dulous, their tips pointing to the ground; the leaves are broader in proportion to their length than in *S. ramosum*, and rather suddenly narrowed, in the last inch or two, to a sub-acute point. I have since found these distinctions to be generally observable in the plants when growing wild, but it is essential to observe them early in their growth, as later in the year the leaves become trodden down, or otherwise injured or disarranged, so that the habit is obscured. Where, however, the plants grow in isolated positions, as in different islets in some parts of the River Wey, the habit of each is quite marked late in to the summer.

I have succeeded in growing a few plants of *S. neglectum* from seed. The fruits which germinated were collected last April in a ditch near Chertsey, and began to grow early in June, so that probably the fruits always lie in the water some seven to eight months before germinating. The stony epicarp apparently remains whole, and the young plant emerges through the base of the beak, which splits up into several strips. The young plants are now about two inches high, and of a pale semi-transparent green colour.

The following are the only additional county records that have come before me :—

Sparganium ramosum Curtis.—Bucks, *G. C. Druce*; Bedford, *G. C. Druce*; Gloster East, *W. Moyle Rogers*; Radnor, *A. G. Wallis* (com. *A. J. Crosfield*); Leicester, *F. T. Mott*; Fife, *J. T. Boswell*.

S. neglectum Beeby.—Essex North, *J. D. Gray*; Suffolk East, *F. F. Linton*; Suffolk West, *W. M. Hind* (com. *Ar. Bennett*); Hunts, *W. R. Linton*.

Thus there has been no northward extension of the range of the latter plant, and in the Eastern Counties it occurs mostly in isolated localities. North Essex, however, seems an exception, as the Rev. J. D. Gray reports it common in ditches about Nayland.

The observations recorded above may be of use as bearing on the question of the distinctness of the two plants, but for the purpose of naming dried specimens they are of quite minor importance, since specimens can scarcely be dried so as to show well these characters; good fruit will always be required to ensure an accurate determination, and this is the case with most of the species.

NOTES ON PONDWEEDS.

By Alfred Fryer.

2. Potamogeton lucens L.—In connection with this old Linnean species a difficulty presents itself which must be discussed before any adequate description can be framed. The question which arises is this: What has to be described? The old aggregate species of Linnæus and subsequent authors, which includes the

segregates, *lucens*, *coriaceus*, *Zizii* and *decipiens*; or an amended *lucens* carried out on the same principle? In this latter case our species will also include *heterophyllus*, *nitens*, and one or two obscure forms which at present have not attained a place in our British catalogues.

Now it is evident that the very comprehensive *lucens* here suggested has the great advantage of keeping together a group of forms which are not always easily separable, especially by inexperienced students; but it has the much greater disadvantage of being so unwieldy as to be practically useless for the communication of precise information, or the interchange of exact ideas, except by the use in many cases of phrases which would restore nomenclature to its pre-Linnean intricacy. To get rid of this fresh difficulty, which has arisen from the laudable desire of some naturalists to express, by their nice adjustment of names, the alliances as well as the dissimilarities of plants, a method of decomposing unwieldy aggregates into *subspecies* has been adopted. But this method is open to the very grave objection that the name-form of the aggregate is likely to be mistaken for the type-form, and so be misleading to all but those who are well versed in the genus. *Potamogeton lucens* certainly is not the type of the cluster of forms we have under consideration, although it is the first-named form.

In this case, then, it will perhaps be found more convenient to relegate the office of expressing alliances to divisional sections or *groups*; and in spite of the unequal value of our *species* to give each form we have decided upon as worthy of separation, full specific rank.

When working in the field amongst the wonderfully varying forms of Pondweeds, when sometimes every ditch seems to have its peculiar form, one is tempted to relinquish the idea of species in despair: nothing seems fixed; each accidental condition seems to produce a corresponding variation in the easily moulded race; and it seems as if a wider knowledge would enable us to include all the forms of the genus under one specific name. But a closer examination of the variations before us soon shows that they are composed of a very limited number of types, each characteristic, either in form or habit, of some other species of the genus; and under the most unusual conditions and in the most extreme forms we seek in vain for something wholly new to the race. In fact we see accidental conditions seized upon and utilised by the plant, which is in no respect compelled to transgress the limits of its genus. In a word, design is the factor, not chance.

Under a continuance of peculiar conditions a variation will continue for many years—probably as long as the conditions remain unchanged; but if we remove the plant and place it where it may grow under more usual circumstances, we find in one or two seasons it reverts to its ordinary form.

A single illustration of a temporary variation, not infrequent in Pondweeds, may be here given; and it is one that at first sight,

even to experienced eyes, suggests specific rank. This is, the occasional development of floating coriaceous leaves in species in which they do not ordinarily occur. All the species of *Potamogeton* seem to raise their flower-spikes above the surface of the water, so that fertilization may take place in the free air. This result is secured in *P. lucens* and *P. pusillus* by a raft-like arrangement of the branches, the great mass of vegetation floating near the surface at the time the flowers expand; in *P. heterophyllus* and *P. zizii*, on the other hand, the mass of vegetation remains at the bottom of the water and the flower-spike reaches the surface by a long and nearly naked stem, at the end of which a buoy is formed, composed of coriaceous floating leaves and cymbiform stipules, which together serve to lift and sustain the flowering spikes above the surface. This fairly describes the usual states of these four species as they grow in the fens around Chatteris. Occasionally, however, we find *lucens* and *pusillus* developing floating coriaceous leaves, and thus approaching the ordinary states of *Zizii* and *heterophyllus*.

It is also necessary, before describing our *P. lucens*, to ask, What is a species? a question not lightly to be answered, nor easily settled. Space would be uselessly filled by any recapitulation of definitions now known to every student. But one thing may be said: when knowledge is sufficiently extended to embrace the greater part of the forms of the genus, it is likely that no one species will be found to possess a single character unshared by some one or other of its congeners. We perhaps may find some such characters so long as we confine our researches to the Pondweeds of a single country, but arguing from what we see at home, it seems very improbable that even the most sharply defined forms stand quite alone, Hence, species in the genus *Potamogeton* must be framed by the aggregation of many characters, more even than are usually employed in other genera.

This note is already too long, so the description of *P. lucens* must be reserved for the next. Space is only left to say, once again, that abnormal variations soon resume their normal appearance when restored to natural conditions of growth; that the variations of each species imitate the forms of other species; and that the results of cultivation of local variations, as well as observations made in the field, alike tend to suggest the expediency of dealing with our multiform Pondweeds as specifically "fixed quantities."*

---

* "By us, as least as workers, species must be dealt with as fixed quantities."—Mr. Carruthers, Journ. Bot. 1886.

A SYNOPSIS OF THE *RHIZOCARPEÆ*.

By J. G. Baker, F.R.S., F.L.S.

(Concluded from p. 283.)

4. Pilularia (Vaill.) Linn.*

Conceptacles globose, coriaceous in texture, placed singly on short pedicels in the axils of the leaves, 2–4-celled, dehiscing at the tip into as many valves as there are cells, each cell (sorus, A. Br.) furnished with a parietal placenta, from which arise numerous sacs with loose cellular membranous walls, the upper sacs representing microsporangia and each containing numerous microspores, the lower sacs representing macrosporangia and each containing a single macrospore.—Submerged inconspicuous plants, with wide-creeping slender rhizomes, with a leaf from the upper side, and a tuft of root-fibres from the lower side of each node. Leaves filiform, without any lamina, circinate in vernation, furnished, like the creeping stem, with several vascular bundles.

Conceptacles 2-celled.	
Macrosporangia 1 in each cell .	Sp. 1.
Macrosporangia many in each cell .	Sp. 2.
Conceptacles 2–4, usually 3-celled .	Sp. 3.
Conceptacles 4-celled	Sp. 4–6.

1. P. minuta Durieu; A. Br. in Berl. Monat. 1863, 435; Dexr. Sc. Alger. t. 38.—Rhizome and leaves much more slender than in *P. globulifera*, the latter 1–1½ in. long. Pedicels longer than the conceptacles, which are not more than ⅓ lin. diam, deflexed, 2-celled. Macrospores globose, not constricted, solitary in the cells.

Hab. South of France, Algeria, Sardinia, and Asia Minor.

2. P. novæ-zelandiæ Kirk in Trans. New Zeal. Instit. ix. 547, t. 29.—Rhizome and leaves more slender than in *P. globulifera*, the latter fewer and more distant, 1½–2 in. long. Pedicels as long as the conceptacles, attached to the centre of their base. Conceptacles ⅛–⅙ in. diam., erect or subcernuous, 2-celled. Macrospores subglobose, not constricted, 10–12 to a cell.

Hab. New Zealand; hills of the southern island, *Kirk* 832! *Berggren*!

3. P. americana A. Br. in Berl. Monat. 1863, 435.—*P. valdiviana* Philippi.—Rhizome and leaves rather more slender than in *P. globulifera*, the latter 1–2 in. long. Pedicel short, arcuate. Conceptacle 2–4, usually 3-celled, 1-12th to 1-8th in. diam., erect. Macrospores subglobose, not constricted, 10–15 to a cell.

Hab. Arkansas, *Nuttall*! Near Santa Barbara, California, *Mrs. Cooper*. Valdivia, Chili, *Philippi*!

4. P. novæ-hollandiæ A. Br. in Berl. Monat. 1863, 435.—Rhizome and leaves rather more slender than in *P. globulifera*, the

---

* See A. Braun in 'Monatberichte der Konigl. Akadamie der Wissenschaften in Berlin,' Oct. 1863 (translated into French Ann. Sc. Nat., Series v., vol. i., p. 93), and Aug. 15, 1872.

latter 1½–2 in. long. Pedicel short, attached to one side of the deflexed conceptacle, which is ⅛ in. diam., 4-celled. Macrospores subglobose, not constricted, 20–25 to a cell.

Hab. Swan River, *Drummond* 991! Tasmania, *Gunn* 1561! South-east Australia, *Hannaford*.

5. P. GLOBULIFERA Linn. Sp. 1563; Valent. in Trans. Linn. Soc. xviii. t. 34; Hook. Brit. Ferns, t. 57.—Leaves usually 2–4 in. long Pedicel very short, erect, attached to the centre of the base of the erect conceptacle, which is 4-celled, ⅛ in. diam. Macrospores ovoid, constricted above the middle, 15-20 to a cell.

Hab. Throughout Europe.

6. P. MANDONI A. Br. in Berl. Monat. 1862, 679.—Leaves rather flattened, 1–1½ in. long. Pedicel arcuate-ascending, ⅛–⅙ in. long, attached to the centre of the base of the 4-celled conceptacle, which is just like that of *P. globulifera*.

Hab. Andes of Bolivia, alpine region, at 16,000 ft. above sea-level, *Mandon* 1534!

NOTICES OF BOOKS.

NEW BOOKS.—U. MARTELLI, 'Florula Bogosensis (Firenze, Ricci: 8vo, pp. vii. 170, t. i.).—A. DENAEYER, 'Les Vegetaux Inférieurs' (Bruxelles, Manceaux: fasc. i. 8vo, pp. 80; 4 microphotographs). —E. DETLEFFEN, 'Wie bildet die Pflanze Wurzel, Blatt und Blüte?' (Leipzig, Freytag: "1887," 8vo, pp. 262; 95 cuts; price 1 mark).

ARTICLES IN JOURNALS.

Bot. Centralblatt (Nos. 46–49). — H. Steininger, 'Beschreibung der europäischen Arten des Genus *Pedicularis*.'

Bot. Gazette (Oct.). — A. Gray, 'Revision of N. American Violets.' — J. M. Coulter & J. N. Rose, 'Synopsis of N. American Pines, based on leaf-anatomy' (1 plate).— C. Robertson, 'Pollination of *Asclepias*' (1 plate). — Obituary of John Goldie (Mar. 21, 1793—June, 1886). — J. M. Coulter, 'Notes on *Hypericum*' (*H. lobocarpum* Gattinger, n. sp.).

Bot. Zeitung (Oct. 29). — K. Goebel, 'Zur Entwickelungsgeschichte des unterständigen Fruchtknotens' (1 plate). —(Nov. 5). J. F. A. Mellink, 'Zur Thyllenfrage' (1 plate). — (Nov. 12). H. Zukal, 'Ueber das Vorkommen von Reservestoffbehälten bei Kalkflechten.'—(Nov. 19). O. Warburg, 'Die öffentlichen Gärten in Britisch-Indien.'

Bull. Soc. Bot. France (xxxiii: comptes rendus 5: Nov. 1).— L. Guignard, 'Sur les ovules et la fécondation des Cactées.'—G. Colomb, 'Etude anatomique des stipules.' — A. Battandier, 'Orchidées d'Algérie' (*Limodorum Trabutianum*, n. sp.).—H. Douliot, 'Structure des Crassulacées.' — H. Lecomte, 'Anatomie des Casuarinées.'— P. Sagot, 'Bananier Féhi, sa forme asperme et sa forme séminifère.'— D. Clos, 'Glossologie Botanique.'—P. Vuille-

min, 'La Membrane des Zygospores de Mucorinées.'—N. Patouillard, '*Helicobasidium* et *Exobasidium*.' — L. Mangin, 'Sur le Pollen.'—P. Van Tieghem & H. Douliot, 'Racines latérales des Monocotylédones.' — L. Guignard, 'Tissue secréteur du fruit de la Vanille.'—A. Battandier, 'Plants d'Algérie' (*Carduncellus Pomelianus*, *Centaurea Malinvaudiana*, spp. nn.). — P. A. Daugeard, '*Chytridium helioformis*, n. sp.'—A. Franchet, 'Plantæ Yunnanenses' (*Clematis Delavayi*, *C. ranunculoides*, *C. yunnanensis*, *C. chrysocoma*, *Anemone glaucifolia*, *A. Delavayi*, *Thalictrum Delavayi*, *T. dipterocarpum*, spp. nn.).

Bull. Torrey Bot. Club (Nov.). — Emily L. Gregory, 'Pores of Libriform Tissue.'—N. L. Britton, 'N. American species of *Cyperus*' (*C. Hallii* Britton, *C. Halei* Torr. MSS., *C. Wrightii* Britton).—E. L. Greene, 'Californian Polypetalæ' (*Dendromecon flaxile*, *Eschscholtzia ramosa*, *Thysanocarpus conchuliferus*, *Erysimum insulare*, spp. nn.).—G. Vasey, 'New Genus of Grasses' (*Orcuttia* (1 plate)).

Flora (Oct. 11, 21, Nov. 1). — E. Goebeler, 'Die Schutzvorrichtungen am Stammscheitel der Farne' (1 plate). — (Oct. 11). W. Nylander, 'Addenda nova ad Lichenographiam europæam' (*Lecanora flavocitrina* and *L. crenulatella*, spp. nn.: from Staveley). —(Oct. 21). E. Röll, 'Zur Systematik der Torfmoose' (concl.).

Gardeners' Chronicle (Nov. 6). — *Masdevallia astuta* Rchb. f., *Eria Fordii* Rolfe, spp. nn. — (Nov. 13). *Catasetum galeritum*, *C. pileatum*, *Dendrobium nycteridoglossum*, *Maxillaria fucata*, spp. nn., all of Reich. f.—*Cratægus pinnatifida*, var. *major* N. E. Br. (n. var.: fig. 121). — Prolific *Oncidium* (fig. 122). — W. G. Smith, *Merulius lacrymans* (fig. 125). — (Nov. 20). *Passiflora Watsoniana* Mast., sp. n. (figs. 126, 127); *Vanda Dearei* Rchb. f., n. sp.

Journ. Linn. Soc. (Oct. 27).—Sir John Lubbock, 'Phytobiological observations: on the form of seedlings and the causes to which they are due' (134 cuts).

Magyar Növénytani Lapok (Oct.). — V. Borbás & J. Csató, 'Formæ Quercuum Comitatus Albæ inferioris' (*Quercus Csatoi* Borb. sp. n.).

Nuov. Giorn. Bot. Ital. (Oct.). — G. Venturi, 'Supra alcune *Brinee* critiche orare racolto dall' Abate A. Corestia (*Barbula chionostoma*, n. sp.). — L. Macchiati, 'I nettarii estrafiorali delle *Amigdalacee*.' — B. Scortechini, 'Nuove Scitanimee trovate nella Penisola Malese' (*Louria* (gen. nov.) *longiflora*, *Amomum macrodons*, *Cyphostigma exsertum*, spp. nn.: 3 plates),—T. Caruel, 'Sue frutto e sui semi del Cacao.' — F. Tassi, 'Di un caso di viviparità e prolificazione della *Spilanthes caulirhiza*.'—P. Senerino, 'Su di una nuova stazione dell *Aceras anthropophora*, suoi caratteri, ezeazione microchimiche della cellule porporine del fiore.'—C. Massalongo, 'Appunte teratologici.'

Oesterr. Bot. Zeitschrift. (Nov.).—T. F. Hanausek, 'Oberirdische Kartoffelknollen.'—J. Bubela, 'Novitäten für die Flora Mährens.' —M. Kronfeld, 'Uber volksthümliche Pflanzennamen.' — E. Formánek, 'Flora der Karpathen.'

LINNEAN SOCIETY OF LONDON.

Nov. 4th.—William Carruthers, F.R.S., President, in the chair. The President, in welcoming the Fellows to the first meeting of the new session, made some remarks as to what work had been done during the recess, and in a passing tribute commented on the loss which Science and the Society had sustained by the death of Mr. G. Busk. He afterwards drew attention to stained specimens, under the microscope, of phosphorescent organisms obtained by him in the Firth of Clyde during September last, the chief being *Ceratium tripos*.—Mr. John Murray made further remarks on the same, stating that near the Cumbrae Islands immense quantities of yellow gelatinous material, containing these organisms in abundance, were obtained at every haul of the net. He alluded to his own observations of the species being found in long chains in the ocean, and to Kleb's opinion that *Ceratium* was a genus of unicellular Algæ and not an Infusorian animal, as ordinarily inferred. —Prof. J. Macoun made remarks on a series of cones of Canadian *Piceas*. He showed that the various forms occurring from the east to the west of the continent, which had been hitherto considered different species, were doubtless local varieties of only one species, slightly modified according to the altitudes and region they inhabited. — There was shown for Mr. W. D'Arcy Godolphin Osborne, fresh specimens of a white variety of *Crocus nudiflorus*, gathered by him in the neighbourhood of Biarritz, France. This was first found by him there in the autumn of 1882, and has since been figured by Mr. G. Maw in his monograph of the genus.—Mr. E. M. Holmes exhibited examples of *Lycoperdon echinatum* Pers., *viz.*, the young plants, and the reticulate appearance of the peridium left by the falling off of the spines.—The only botanical paper read was one of a somewhat technical character, on the Berberidaceæ of Japan, by Mr. Tokutaro Ito, a native of Japan, at present studying at Cambridge University.

OBITUARY.

We regret to record the death of Mr. C. E. Broome, of Bath, which took place on the 15th ult. We shall give an obituary notice in an early issue. His herbarium is bequeathed to the British Museum.

We have also to record the death, at Cheltenham, on September 11th, of Dr. Harvey Buchanan Holl. Dr. Holl was a careful and earnest lichenologist, although, owing to his retiring disposition, he never published any of his observations. He was born Sept. 28th, 1820, and at an early period of life took up the study of geology; his few published papers relate to that science. Dr. Holl's botanical collections have been acquired by the British Museum.

We learn with much pleasure that the University of Oxford has conferred the degree of M.A., *honoris causa*, on our contributor, Mr. Henry Boswell, of Oxford.

INDEX.

For classified articles, see—County Records; Journals, Articles in; Reviews.
New Genera and Species published in this volume are distinguished by an asterisk.

Aconitum noveboracense, 352
Acrostichum inæqualifolium,* 273; viridifolium,* 273
Acrostichum, new species of, 256
Acrothecium obovatum, 203; simplex, 203; xylogenum,* 203
Adiantum Birkenheadii, 190
Æchmea chiriquensis,* 243
Aeranthus polyanthemus, 156
Aerides Godefroyanum, 255
Agapetes Forbesii,* 290; Moorhousiana, 291
Agaricus, new species of, 256, 429
Age of existing plants, 308
Agrostis, new species of, 156
Albuca corymbosa, 255; Massoni,* 336
Alocasia grandis, 320
Alpinia affinis,* 357; decurva,* 357
Alsophila dissitifolia,* 182
Amblystegium Cashii, 32
Amomum macrodons, 383; vittatum,* 53
Amorphophallus Doryphorus,* 305
Anemone nudicaulis, 91
Angræcum nervosum, 353
Angolan Selagineæ, 174
Anthurium, new species of, 288
Aposphæria inophila, *var.* pseudoplatani, 135
Arenaria ferruginea, 88
Aristida, new species of, 125, 156
Aristolochia ridicula, 320; salpinx, 352
Arnold, F. H., Hampshire plants, 345
Asplenium æquibasale, 256; brunneo-viride,* 269; Hortianum,* 268; jamaicense,* 268; Taylorianum,* 269
Astragalus casapaltensis, 32
Azolla caroliniana, 100; filiculoides, 100; nilotica, 101; pinnata, 100; rubra, 100
Babington, C. C., Pembroke plants and Rev. Mr. Holcombe, 22; British Rubi, 216, 225
Bacteriology, recent books on, 350
Bactrodesmium cardincola, 200
Bagnall's Handbook of Mosses, 151
Baker, J. G., Relation of British Rubi to continental types, 4, 43, 71; European Primulas, 25; Synopsis of Rhizocarpeæ, 97, 274, 381; New Fiji Ferns, 182; Hemitelia Hartii,* 243; Æchmea chiriquensis,* 243; New Cape Liliaceæ, 335
Balanophora, new species of, 157, 352
Balfour's 'Plants of Bible' (rev.), 29
Ball, J., Prof. Philippi's Researches in Chili, 65
Barbula chionostoma,
Barrington, R. M., Flora of St. Kilda, 213
Bauhinia cretacea, 189
Beeby, W. H., Equisetum litorale in Britain, 54; Polypodium Phegopteris in W. Sussex, 113; on Utricularia, 113; on Sparganium neglectum, 142, 377; New Surrey plants, 346; Callitriche truncata in W. Kent, 346
Belfast Field Club Report, 223
Bennett, A., Additions to Flora of Iceland, 67; De Vos' Flore de Belgique (rev.), 85; Labelling of alien species, 111; Carex helvola in Britain, 149; Distribution of Potamogeton, 139, 363; Potamogeton coriaceus, 223; Scirpus rufus in W. Suffolk, 223
Bisset, J. P., On Japanese Desmids, 193, 237 (t. 268)
Bloom on Leaves, 95
Blyxa radicans, 158, 256
Bolus on S. African Flora, 223
Bommerella, 61
Bonavia's "Date Palm," 124
Boottia, new species of, 158, 256
Botanical Nomenclature, 244
Boulger, G. S., John Morris, 64;

on Kidston's 'Palæozoic Plants,' 285
Braithwaite, R., on Bagnall's Handbook of Mosses' (rev.), 151
Brecon Plants, 22, 24
Britten, J., Hookera v. Brodiæa, 49; John Zier, 101; George Jackson, 137; W. W. Newbould (port.), 161; New 'London Catalogue' (rev.), 184; Druce's 'Flora of Oxfordshire' (rev.), 249; 'Dict. of Gardening' (rev.), 55; Nomenclature of Proteaceæ, 296
British Museum Bot. Dept. Report for 1885, 244
Brodiæa (Hookera), 49
Bromus frigidus, 32
Brownleea madagascarica, 156
Bryum Lindbergii, 319
Bulbophyllum cornutum,* 325; kermesianum,* 325; paniculatum,* 326; saurocephalum, 280; new species of, 156
Bull, Dr. H. G., 62
Caithness plants, 23, 85, 344
Camasporium metableticum, 157
Campylopus symplectus, 62
Cantharellus gregarius, 125
Carrington, B., on Spruce's 'Hepaticæ Amazonicæ' (rev.), 122
Carruthers, W., Additions to Bot. Dept., Brit. Mus., 244; James Hannington, 128; the age of existing plants, 309
Carex helvola in Britain, 149
Cassell's 'Garden Flowers,' 90
Castilloa elastica, 93
Catanthera,* 289; lysipetala,* 289
Catasetum, new species of,
Catenularia* simplex,* 201
Celastrus, new species of, 256
Cercospora ferruginea, 204
Ceylon, Flora of, 301, 327
Chætotropis andina, 32
Characeæ, British, 1
Chara papillosa (t. 263), 1; fragilis, *var.* 22
Cheilanthes Reesii,* 267
Chili, Philippi's researches in, 65
Chinese Plants, 17, 53
Chlamysporum, 52
Chondrorrhyncha Lendyana, 256
Christy, M., rate of increase in fairy rings, 285
Circeaster, 88
Cladodium Limprichtii, 189
Cladostrichum passifloræ, 32
Clarke, B., on Lightia and Erisma. 82
Colignonia biumbellata, 32
Collonema* papillatum, 136
Coniothecium chomatosporum, 201
Coniothyrium rostellatum,* 135
Cooke's 'Illustrations of Brit. Fungi' (rev.), 252; 'British Desmids,' 254
Cosmarium capitulum,* 195; decachondrum,* 196; fusum,* 194; orthopleurum,* 194
Cotyledon chiclensis & incanum, 32
Coulter's Botany of Rocky Mountains (rev.), 27
County Records:—
Aberdeen, 84, 143
Anglesea, 1
Bedford, 3, 25, 247, 346, 347
Brecon, 22, 24, 285
Bucks, 378
Caithness, 3, 23, 84, 148, 343, 377
Cambridge, 4, 223, 306, 345
Carnarvon, 1, 340
Chester, 1, 2
Cornwall, 231
Cumberland, 143
Denbigh, 339
Derby, 65, 75
Devon, 6, 7, 8, 44, 72, 78, 104, 144, 176, 218, 220, 227, 228
Dorset, 1, 142
Durham, 225
Essex, 376, 378
Fife, 225, 378
Forfar, 1, 84
Glamorgan, 23, 83, 112, 376
Gloucester, 24, 142, 230, 345, 346, 368
Hants, 1, 3, 6, 7, 231, 345
Hereford, 2, 130, 226
Hertford, 71, 228
Huntingdon, 2, 3, 142, 376
Kent, 346
Lancaster, 218, 224
Leicester, 378
Lincolnshire, 2
Merioneth, 339
Middlesex, 224, 376
Monmouth, 219, 368
Norfolk, 2, 4, 112, 142, 143, 231, 308, 317, 376
Northampton, 284, 370
Nottingham, 3
Orkneys, 377
Oxford, 2, 142, 143, 249
Pembroke, 1, 22
Perth, 84, 143, 218, 219, 223, 225
Radnor, 378
Ross, 263
Shetland, 377

Shropshire, 1, 143
Somerset, 1, 2, 207, 307, 309
South Ebudes, 308
Stafford, 3, 143
Stirling, 143
Suffolk, 3, 140, 223, 227, 283, 378
Surrey, 2, 5, 43, 54, 72, 111, 142, 143, 221, 223, 229, 232, 346
Sussex, 113, 284
Sutherland, 1, 3, 148, 343, 377
Warwick, 84, 129, 142, 143, 197, 218, 226, 227, 231
Westmoreland, 24, 143, 381
Wilts, 2, 24, 284
Worcester, 133, 142, 143
York, 44, 74, 143, 224, 227, 231
See also list of Potamogetons, 139, 363; papers on Rubi, 4, 43, 79, 216, 225; New Fungi, 129, 197
Cromer, plants of forest bed at, 93
Crommelin's 'Poets in the Garden,' 89
Crotalaria Schweinfurthii, 156
Cullum, Sir John, 22
Cuming's Philippine plants, 57, 347
Cyathea Thurstoni,* 182
Cybele (Stenocarpus), 299
Cyrtopera Regnieri, 320
Cylindrina, 255
Cynosorchis, new species of, 156
Cyperus, new species of, 383
Cyphostigma exsertum,
Cypripedium callosum, 321; Sanderianum, 191
Cyrtopera papuana,* 354
Dactylella ellipsospora, 200; minuta, 200
Dactylosporium brevipes,* 204
Dalla-Torre's Tourist's Guide (rev.), 154
Darwinism, A. Gray on, 155
Davallia Sloanei, 37
Davidson, A., Caithness Botany, 23
Delphinium densiflorum, 88
Dendrobium albiflorum,* 323; cerasinum,* 324; Forbesii,* 323; hercoglossum, 352; inanditum, 352; longicolle, 323; nycteridiglossum, 388; puniceum,* 324; reptans,* 323; trichostomum, 324; triquetrum,* 322; new species of, 256, 288
Dendrocalamus Forbesii, 360
Dendrochilum citrinum,* 206
Dendromecon flexile,
Deschampsia Mathewsi, 32
Desmids, Japanese, 193, 237 (t. 268)
Dianthus, Supplement to enumeration of, 301; angolensis,* 301; Borbasii, 224
Dicksonia antillensis,* 267; new species of, 256
Didymosporium profusum, 197
Diplachne Reverchoni, 255
Diplodia hederæ, 135
Disa pulchella, 296; new species of, 32
Disperis, new species of, 32
Dixon, H. N., Ross-shire Mosses, 263; Northampton plants, 284, 285; Suffolk Mosses, 283
Docidium baculoides,* 241; crenulatum, 241
Dodecatheon Hendersoni, 352
Drake del Castillo, 'Illustr. Floræ Ins. Maris Pacifica,' 188
Druce, G. C., Wilts and Gloucester Plants, 24; his Flora of Oxford (rev.), 249; Northamptonshire Plants, 370
Dryandra = Josephia, 299
Drymaria nitida, 32
Duthie's Saháranpur Gardens Report, 88
Eatonia, new species of, 189
Echinobotryum læve, 200
Egyptian plants, ancient, 312
Elymus arenarius, 307; new species of, 255
'English Botany' Index, 254
Epidendrum pristes, 288
Equisetum litorale in Britain, 54, 95
Eria puberula,* 326; new species of, 32
Eriosphæria inæqualis,* 132
Erisma, 83
Eritrichium Mandonii, 32
Erysimum insulare,
Eschscholtzia ramosa,
Esmeralda Clarkei, 352
Eucomis zambesiaca, 62
Eucharis Mastersii, 32
Eulophia gracillima,* 292; macra, 156
Euonymus, new species of, 256
Eurya distichophylla, 190
Evodia, new species of, 189
Fairy Rings, rate of increase in, 285
Fawcett, W., Agapetes Forbesii, 291
Festuca casapaltensis, 32; texana, 255
Ferns, Jamaica, 14, 33
Fiji Ferns, 182

Flower, T. B., Helleborus fœtidus in Glamorgan, 83; Elymus arenarius in N. Somerset, 307; Senecio squalidus in S. Somerset, 309
Forbes' New Guinea Plants, 321
Fordia (n. gen.), 256
Forest beds, plants of, 93
Fraser, J., Chara fragilis *var.* delicatula, 22; Helleborus fœtidus in Glamorgan, 23; Orchis Morio with two columns, 183; Thesium linophyllum, 344
Freycinetia angustissima,* 359; Forbesii,* 359
Friend's 'Ministry of Flowers,' 90
Fryer, A., Narcissus Pseudo-narcissus in Brecon, 24; on Pondweeds, 306, 337, 378; Epilobium angustifolium in Cambs, 345
Fungi, new or noteworthy, 129, 147
Fusidium lycotropum, 198
Geotrichum roseum,* 198
Gepp, A., appointed to Brit. Mus., 96
Gibberella cyanogena, 133
Gliocladium lignicolum,* 199
Goldie, John, 382
Goniophlebium caudiceps, 91
Goodale's Physiological Botany (rev.) 149
Goodyera papuana,* 355
Graphium penicilloides, 205
Gray (Asa) on Darwinism, 155
Gray's 'Lichens' and 'Mosses,' 287
Grindon's 'Fruits and Fruit-trees' (rev.), 28
Griselinia alata, 156
Groves, H. & J., Notes on British Characeæ, 1 (tt. 263, 264)
Grove, W. B., New or noteworthy Fungi (tt. 266, 267), 129, 197; Saccardo's 'Sylloge Fungorum' (rev.), 247
Gussonea exilis, 292
Gymnoascus Reesii, 129; ruber, 129
Habenaria combusta,* 294; eburnea,* 293; leptobrachiata,* 293; militaris, 352; variabilis,* 294; Vogelii,* 295; Wilfordii,* 295; new species of, 156
Hanbury, F. J., Botany of Caithness & Sutherland, 95, 148, 343; New London Catalogue, 184
Hance, H. F., Chinese Plants, 17, 53; Death of, 256
'Handbook of Plant Dissection,' 188
Harlow, James, 14
Harrison, A. W., Abnormal Woundwort, 283
Hart, H. C., Irish Hawkweeds, 47; Irish Hepatics and Mosses, 360
Hawaiian Flowers (rev.) 27
Hebenstreitia angolensis,* 174
Hehn's 'Wanderings of Plants,' 89
Helicosporium albidum,* 204; lumbricoides, 204
Helleborus fœtidus in Glamorgan, 23, 83
Helminthosporium Hirudo, 202; hormiscoides, 202; parvum,* 203
Hemitelia Hartii,* 243; microsepala,* 266; Sherringii,* 266
Herbaria, 310
Hibbert, George, 296
Hieracium chiclense, 32
Hieracia, Irish, 47, 83; notes on, 84
Holcombe, Rev. Mr., 22
Holmes' 'Fungi,' 287
Holothrix glaberrima, 156; montigena,* 295
Holt, G. A., Thamnium* augustifolium (t. 265), 65
Hooker, William, 51
Hookera v. Brodiæa, 49; H. multiflora, 51
Hylogyne (Telopea) 299
Hymenophyllum Houstonii,* 42
Hypericum lobocarpum, 382
Iceland Plants, 67
'Icones Plantarum,' 30, 224
Ilex ficoidea, 256
Impatiens, new species of, 256
Imperata brevifolia, 125
Irish Plants, 1, 2, 3, 18, 47, 83, 84, 223, 228
Isaria sulphurea, 205
Jackson, B. D., Botanical Nomenclature, 244
Jackson, George, 137
Jamaica Ferns, 14, 33, 265
Japanese Desmids, 193, 237 (t. 268)
Jenman, G. S., Jamaica Ferns, 14, 33, 265
Jenner, J. H. A., Peloria on Ophrys apifera, 284
Josephia (Dryandra), 299
Journals, Articles in:—
American Naturalist, 61, 125, 319
Ann. Mag. Nat. Hist., 352
Ann. Sciences Nat. 31, 91, 155
Annuario del Instit. di Roma, 224
Bot. Centralblatt, 31, 61, 91, 125, 189, 224, 288, 319, 352, 382
Bot. Gazette, 61, 91, 125, 189, 254, 319, 352, 382
Bot. Notiser, 61, 91, 155, 189, 319

Bot. Zeitung, 31, 31, 91, 125, 155, 189, 224, 251, 288, 312, 352, 382
Bull. Soc. Bot. Belg., 61, 255
Bull. Soc. Bot. France, 61, 155, 189, 255, 320, 382
Bull. Torrey Bot. Club, 61, 125, 156, 181, 255, 288, 320, 352, 383
Flora, 31, 91, 125, 190, 255, 288, 320, 352, 383
Garden, 255
Gard. Chronicle, 32, 62, 91, 125, 156, 190, 224, 255, 288, 320, 352, 383
Grevillea, 32
Icones Plantarum, 30
Journ. Linn. Soc. 32, 62, 156, 190, 256, 383
Journ. R. Microscop. Soc., 91, 288
Magyar Nov. Lapok, 32, 62, 190, 320, 383
Midland Naturalist, 125, 156, 256
Malpighia, 320
Notarisia, 90, 156, 288, 352
Nuov. Giorn. Bot. Ital., 62, 156, 256, 383
Oesterr. Bot. Zeitschrift, 32, 62, 91, 125, 156, 190, 224, 256, 288, 320, 352, 383
Pharmaceutical Journal, 91, 157, 256
Proc. Linn. Soc. N. S. Wales, 288
Revue Botanique, 32
Science Gossip, 91, 157
Scottish Naturalist, 62, 157, 352
Stonyhurst Magazine, 224
Trans. Bot. Soc. Edinb. 32, 125
Trans. Linn. Soc. 352
Karatas amazonica, 255
Kew Seed-list (rev.), 151
Kidston's 'Palæozoic Plants' (rev.), 285
Knight, Joseph, 296
Knightia = Rymandra, 299
Kobresia Duthiei, 88
Labelling of Alien Species, 111
Lachenalia Massoni,* 326; succulenta,* 326; undulata,* 326
Lactuca filicata, 88
Lælia Batemanniana, 288
Lagarosiphon, new species of, 256
Lathræa Squamaria, structure of, (t. 269), 257
Lecidea, new species of, 125
Lejeunea, new species of, 288
Lentinus, new species of, 127, 352
Lentomita ampullacea, 130
Leptosphærites Lemoinii, 61
Lightia, 82
Linospadix Forbesii,* 350
Linnean Society, 92, 126, 157, 190, 384
Linton, E. F., Naias flexilis at Killarney, 83; Caithness Botany, 85; Glamorgan Plants, 112; Rubus pallidus in Britain, 308; West Ireland Botany,
Linton, W. R., West Ireland Botany, 18; New Records, 376
Linum Aristidis, 156
Liparis, new species of, 156, 256
Lissochilus Taylorii,* 293
Littonia minor, 156
Lomatia = Tricondylus, 299
'London Catalogue of British Plants' (rev.), 184
Lophiotrichya Viburni, 61
Lowia, 382
Lubbock's 'Flowers, Fruits, and Leaves,' 154
Lugonia andina, 32
Marsilea, Monograph of, 274; ægyptiaca, 281; ancylopoda, 282; angustifolia, 277; Berteroi, 282; biloba, 280; Brownii, 275; Burchellii, 279; capensis, 280; concinna,* 279; condensata,* 281; coromandelina, 282; crenulata, 275; deflexa, 275; diffusa, 276; distorta, 283; Drummondii. 281; Ernesti, 279; fimbriata, 278; gibbosa, 280; gymnocarpa, 281; hirsuta, 278; macrocarpa, 280; macropus, 275; mexicana, 279; minuta, 276; muscoides, 283; mutica, 282; nubica, 278; polycarpa, 275; pubescens, 277; quadrata, 281; quadrifoliata, 275; rotundata, 280; senegalensis, 277; strigosa, 278; subterranea, 280; tenuifolia, 277; trichopoda, 282; vestita, 278; villosa, 278
Masdevallia astuta, 383; striatella, 256
Massee, G., Structure of Lathræa (t. 269), 257
Masson's drawings, 335
Massonia læta,* 336; latebrosa,* 336
Mastigo coleus, 156
Maxillaria Endresii, 120; furcata, 383
Megaclinium maximum, 292
Melanomina longicolle, 132
Meliosma Fordii & M. patens, 256
Melodorum Oldhami, 190
Meniscium Hosei, 256
Mennell, H. T., E. Norfolk Plants, 112
Metzgeria, new species of, 256
Microstylis bella, 62
Miller, W. F., Flora of Colonsay, 308

Morris, D., appointed to Kew, 32
Morris, John, 64
Mortierella polycephala, 129
Mucor racemosus, 129
Mueller, F. von, New Vacciniaceæ from N. Guinea, 289
Muhlenbergia, new species of, 156
Murray, G., on Goodale's 'Physiological Botany' (rev.), 149; Books on Bacteriology (rev.), 350
Murray, R. P., Somerset Rubi, 206
Mycenastrum Dugesii, 189
Mystacidium viride, 156
Naias flexilis at Killarney, 83
Nectriella chrysites, 133
Nephrodium calcareum,* 271; caribæum,* 270; decadens,* 183; maximum,* 182; Nockianum,* 270; paucijugum,* 270; new species of, 256
Neuwiedia calanthoides (t. 271), 355
New Books, 30, 60, 90, 124, 155, 189, 224, 254, 287, 319, 351, 382
New British Freshwater Algæ, 91
New Guinea Plants, 321
New or noteworthy Fungi, 129, 197 (tt. 266, 267)
New Phanerogams published in 1885, 113
Newbould, W. W., death of, 159; Memoir and portrait, 161
Nicholson, G., Rosa Ripartii in Britain, 111; his 'Dict. of Gardening' (rev.), 55
Niptera Riccia, 133
Nitella capitata (t. 264), 3
Nitophyllum carybdæum, 156
Nivenia = Paranomus, 300
Nomenclature, Botanical, 49, 296
North Wales Plants, 338
Nymphæa alba, var. of, 25
Oberonia Hamadryas,* 322
Obituary:—
Henry Graves Bull, 63
John Morris, 64
James Hannington, 128
William Williamson Newbould, 159, 161 (port.)
Randal Hibbert Alcock, 160
Charles Edward Broome, 384
Harvey Buchanan Holl, 384
Odontoglossum Harryanum, 352
Œnothera psychophila, 32
Oncidium, new species of, 62, 190, 320
Onychonema filiforme, 242
Ophiobolus meliolæoides, 61
Ophrys apifera, peloria in, 284
Orchidantha, 352
Orchis Morio with two columns, 183
Orcuttia, 381
Orthotrichum Gevaliense, 155
Pringlei, 255
Ottelia, new species of, 256
Paget's (Sir J.), British Herbarium, 96
Panicum Nealleyi, 125
Paranomus (Nivenia), 200
Paspalum, new species of, 320
Passiflora Watsoniana, 383
Pedicularis Jankæ, 224
Peloria in Ophrys apifera, 284
Pestalozzia fibricola,* 198; longiseta, 198
Philippi's Researches in Chili, 65
Philippine plants, 57, 347
Phillips, W., on Stevenson's 'Hymenomycetes Britannici' (rev.), 186; Cooke's 'Illustrations of Brit. Fungi' (rev.), 252
Phoma delitescens, 134; hysterella, 134; ilicicola, 134; lineolata, 134; pithyophila, 139
Phragmicoma, new species of, 288
Phreatia* albiflora,*326; papuana,* 327
Phyllosticta Stephanoti,* 134
Plagiochila bifida, 224
Pinguicula vulgaris, 346
Polygala, new species of, 190
Polygonum parvulum, 88
Polypodium Hartii,* 272; minuatum,* 271; nutatum,* 272; stenopteron,* 183; new species of, 91, 256; Thomsonii,* 183
Polyporus oleæ, 186
Potamogeton, distribution of, in Britain, 139, 363; P. coriaceus, 223; Curtisii, 288; fluitans, 306; Wrightii, 320; natans, 337
Primula, new species of, 88, 156, 189; European, 25
Proteaceæ, Nomenclature of, 296
Pseudodiplodia* corticis, 197
Psilopeganum, 256
Psyllothamnus, 30
Ptychosperma caryotoides,* 358
Puccinia carniolica, 32
Pyrenotheca, 255
Ramularia calcea, 199
Ranunculus chiclensis, 32; Polii, 190
Rattray's 'Forestry,' 124
Rawdon, Sir Arthur, 14
Reader, H. P., Gloucester and Monmouth Plants, 368
Reviews:—
Indigenous Flowers of Hawaii. By Mrs. Sinclair, 27
Manual of Bot. of Rocky Mountains. By J. M. Coulter, 27

Fruits and Fruit-trees. By L. H. Grindon, 28
Botaniska-Kalendar. Von P. Sydow & C. Mylius, 29
Plants of Bible. By J. H. Balfour, 29
Dictionary of Gardening. By G. Nicholson, 55
Phanerogamæ Cumingianæ. Por S. Vidal, 57
Flore Complète de la Belgique. Par. A. de Vos, 85
Orchid Grower's Manual. By B. S. Williams, 87
Report on Saharanpur Gardens. By J. F. Duthie, 88
Hepaticæ Amazonicæ. By R. Spruce, 122
Physiological Botany. By G. L. Goodale, 149
Handbook of Mosses. By J. E. Bagnall, 151
Kew Seed-list, 151
Tourist's Guide to Alps. By K. W. v. Dalla-Torre, 154
London Catalogue, ed. viii., 184
Hymenomycetes Britannici. By J. Stevenson, 186
Sylloge Fungorum. By P. A. Saccardo, 247
Flora of Oxfordshire. By G. C. Druce, 249
Illustrations of British Fungi. By M. C. Cooke, 252
Palæozoic Plants. By R. Kidston, 285
Revision de Plantas Filipinas. By S. Vidal, 347
Books on Bacteriology, 350
Rhabdospora inæqualis, 136; plæosporoides, 136
Rhamnus rugulosa, 256
Rhododendron, new species of, 320; Vidalii, 348
Ridley, H. N., Williams' Orchid Grower's Manual (rev.), 87; Tropical African Orchids, 291; new Amorphophallus, 305; Forbes' N. Guinea Monocotyledons, 321; Habenaria albida in Brecon, 284
Riella Battandieri, 288
Rhipilia Andersoni, 127, 352
Rhizocarpeæ, Synopsis of, 97, 274, 381
Rolfe, R. A., Philippine Plants, 57, 347; Angolan Selagineæ, 174
Rogers, W. M., Flora of Upper Tamar, 8, 78, 104, 144, 176; N. Wales plants, 338, 363; E. Gloucester plants, 346; Elymus arenarius in S. Wilts, 284
Romanes on Physiological Selection, 191
Rosa Ripartii in Britain, 111; petrophila, 190
Roy, J., on Japanese Desmids, 193, 237 (t. 268)
Rubi, relation of British to continental types, 4, 43, 79; Babington's notes on British, 216, 225; Somerset, 206; of Devon, 78
Rubus pallidus in Britain, 303; leucocarpus, 345; new species of, 29, 288, 320
Rymandra (Knightia), 299
Sabia Swinhoei, 256
Saccardo's Sylloge (rev.), 247
Salisbury, W., 50
Salvinia adnata, 99; auriculata, 99; cucullata, 99; hastata, 98; Hildebrandtii,* 98; lævigata, 99; minima, 98; mollis, 98; nigropunctata, 98; nymphellula, 99; oblongifolia, 67; Radula,* 98; Sprucei, 99
Satyrium, new species of, 32, 156
Saunders, J., Pinguicula vulgaris and Carum Carvi in S. Beds., 346
Saurauja Oldhami, 190
Saxifraga Stolitzkæ, 88
Schismatoglottis neoguineensis, 32
Sclerotheca, new species of, 189
Scribneria, 189
Scirpus dissitus, 88; rufus in E. Suffolk, 223
Sedum, new species of, 32, 88
Selaginella canilensis,* 273; gracilis, 255; setigera, 273
Selago alopecuroides,* 175; Welwitschii,* 175
Senecio casapaltensis, 32; squalidus, 250
Septocylindricum chætospira,* 199; pallidum,* 199
Sieveking's 'Praise of Gardens,' 89
Sievekingia, new species of, 352
Sinclair's (Mrs.), Indigenous Flowers of Hawaii (rev.), 27
Sloane's Jamaica Ferns, 14, 33
Smith, W. G., H. G. Bull, 62
Soranthe (Sorocephalus), 299
Sorocephalus=Soranthe, 299
South London Nat. Hist. Club, 223
Sparganium neglectum, 142
Spathoglottis Augustorum, 62; stenophylla,* 354
Sphærozoma granulatum,* 242
Spruce's 'Hepaticæ Amazonicæ' (rev.), 122

Sporotrichum merdarium, 199
Stachybotrys dichroa,* 201
Stachylidium extorre, 202
Stachys sylvatica, abnormal, 283
Staganospora ilicis,* 135
Staurastrum globosum,* 237; oxyrhynchum,* 238; pseudocuspidatum,* 237; quadricornutum,* 240; subarmigerum,* 239; submonticulosum,* 238; subtaliferum,* 238
Stellaria raphanorrhiza, 190
Stemphylium Magnusianum, 205
Stenocarpus=Cybele, 299
Stevenson's 'Hymenomycetes Britannici' (rev.), 186
Stewart, S. A., Irish Hieracia, 83
Stipa Lettermani, 156
Streptanthus, new species of, 288
St. Kilda, Flora of, 213
Sutton's 'Permanent Pastures,' 319
Sydow & Mylius, 'Botaniska-Kalendar' (rev.), 29
Symplocos luzoniensis, 348
Tapeinocheilus pubescens,* 356
Telopea=Hylogyne, 299
Tephrosia ovaria,* 17
Tetraploa cristata, 200
Thamnium angustifolium* (t. 265), 65
Thesium linophyllum, 344
Thonningia malagasica, 157, 352
Thrixspermum indusiatum, 198
Thysanocarpus conchuliferus, 383
Thysanotus (Chlamysporum), 52
Trichoglottis leontoglossa,* 355
Trichosporium murinum, 201
Trimen, H., Flora of Ceylon, 301, 327
Traill's (Mrs.), 'Studies of Plant-life in Canada,' 88
Tricholepis hypoleuca, 88
Trichomanes Hosei, 256
Trichosporum, 43
Tricondylus (Lomatia), 299
Trifolium chiclense, 32
Trisetum montanum, 255
Tritonia Wilsoni, 256
Utricularia, 113; bicornis, 288
Ustilago Primulæ, 125
Vaccinium Forbesii,* 121
Valeriana remota, 32
Valsa cincta, 131
Vanda Dearei, 383; Lindeni, 256
Vicia fulgens, 156
Vidal's books on Philippine plants (rev.), 57, 347
Viola Rossii, 190; spectabilis, 32; Websteri, 190
Vitis, new species of, 256
West, W., Pilularia in Westmoreland, 24
White, J. W., Elymus arenarius in N. Somerset, 307; Rubus leucocarpus, 345
Williams, F., Suppl. Enum. Dianthi, 301
Williams' 'Orchid Grower's Manual' (rev.), 87
Xanthidium leiodermum,* 240
Zingiber brevifolium, 320
Zier, John, 101
Zanthoxylum, new species of, 256

ERRATA.

Page 22, lines 3 and 10 from bottom, *for* "Bullum" and "Cullam," *read* "Cullum." P. 25, l. 20 from top, *for* "Loth Ame," *read* "Loch Awe." P. 32, l. 3 from top, *for* "*Erica*," *read* "*Eria*." P. 51, l. 5 from top, *for* "1811," *read* "1810"; l. 6, *after* "*l. c.*," *insert* "t. 98 &." P. 56, l. 16 from top, *for* "*O.*," *read* "*M.*" P. 64, l. 20 from top, *for* "months," *read* "weeks." P. 91, l. 8 from top, *for* "Bownes," *read* "Barnes." P. 95, l. 23 from top, *for* "Loeslid," *read* "Læstad." P. 102, footnote, *for* "316," *read* "216." P. 115, l. 7 from bottom, *for* "chichlensis," *read* "chiclensis." P. 116, l. 10 from bottom, *for* "Drymeria," *read* "Drymaria." P. 120, l. 20 from top, *for* "chichensis," *read* "chiclensis." P. 127, l. 19 from bottom, *for* "Jorden," *read* "Sonder." P. 139, l. 25 from top, *for* "Hancock," *read* "Haworth." P. 243, l. 4 from top, *for* "Forest," *read* "Botanical." P. 255, l. 22 from bottom, *for* "Nasey," *read* "Vasey." P. 285, l. 11 from top, *for* "Bidley," *read* "Ridley." P. 328, l. 12 from top, *for* "Lycopodiums," *read* "Lygodiums." P. 333, l. 8 from bottom, *for* "Pau," *read* "Palu." P. 327, l. 20 from top, *for* "midrib," *read* "petiole."

WEST, NEWMAN & CO., PRINTERS, HATTON GARDEN, LONDON, E.C.

Annual Subscription, paid in advance, Twelve Shillings, post free within the Postal Union. Single Numbers, 1s. 3d.

No. 282. JUNE, 1886. Vol. XXIV.

THE JOURNAL OF BOTANY

BRITISH AND FOREIGN.

EDITED BY

JAMES BRITTEN, F.L.S.,

British Museum (Natural History), South Kensington.

CONTENTS.

	PAGE
William Williamson Newbould. By James Britten, F.L.S. (With Portrait)	161
Angolan *Selaginea*. By R. A. Rolfe, A.L.S.	174
On the Flora of the Upper Tamar and Neighbouring Districts. By the Rev. W. Moyle Rogers, F.L.S. (Concluded)	176
New Ferns collected by J. B. Thurston, Esq., in Fiji. By J. G. Baker, F.R.S.	182
Short Note. — *Orchis Morio* with two Columns	183
Notices of Books:—	
The London Catalogue of British Plants. Ed. viii. Edited by Frederick J. Hanbury	184
Hymenomycetes Britannici: British Fungi (Hymenomycetes). By the Rev. John Stevenson.	186
Short Notices	188
New Books	189
Articles in Journals	189
Linnean Society of London	190

LONDON:

WEST, NEWMAN & CO., 54, HATTON GARDEN, E.C.

DULAU & CO., SOHO SQUARE.

Price One Shilling and Threepence.

NOTICE.

The JOURNAL OF BOTANY is printed and published by WEST, NEWMAN & Co., 54, Hatton Garden, London, E.C., to whom Subscriptions for 1886 (in advance, Twelve Shillings; if not paid in advance, chargeable at the rate of 1s. 3d. per number) should be paid. Post-Office Orders may be drawn on the Hatton Garden Office.

The Volume for 1885 (price 16s. 6d., bound in cloth) is now on sale; also covers for the Volume (price 1s. 2d. post free).

The Volumes for 1883 and 1884 can still be had.

For Volumes and back numbers for 1872—82 application should be made to DULAU & Co., Soho Square, W.

The Editor will be glad to send the JOURNAL OF BOTANY in exchange for other Journals of a similar character. Such Journals, books for review, and communications intended for publication, to be addressed to JAMES BRITTEN, Esq., 18, West Square, Southwark, S.E.

He will be greatly obliged to the Secretaries of Local Natural History Societies if they will forward him copies of their Transactions, so that any paper of botanical interest may be recorded in this Journal.

TERMS FOR ADVERTISEMENTS.

Whole page	£2	0	0	Quarter page	0	15	0
Half page	1	5	0	Six lines and under	0	5	0

Every additional line, 9d.

A liberal reduction is made for a series.

To be sent to WEST, NEWMAN & Co., 54, Hatton Garden, not later than the 24th of each month.

AUTHOR'S SEPARATE COPIES.

Authors who require copies of their articles are requested to order separate copies from the Publishers, and to notify this and state the number required at head of their MS.; otherwise the type may be distributed before the order is received. By the buying of additional copies of the Journal sets are destroyed. The charges for separate copies are as under :—

2 pages	25 copies		4s.	4 pages	25 copies		5s.	8 pages	25 copies		8s. 0d.
,,	50	,,	5s.	,,	50	,,	6s.	,,	50	,,	9s. 0d.
,,	100	,,	7s.	,,	100	,,	8s.	,,	100	,,	10s. 6d.

A greater number of pages to be charged in equal proportion. Separate Titles, Wrappers, &c., extra.

Annual Subscription, paid in advance, Twelve Shillings, post free within the Postal Union. Single Numbers, 1s. 3d.

No. 278. FEBRUARY, 1886. Vol. XXIV.

THE JOURNAL OF BOTANY

BRITISH AND FOREIGN.

EDITED BY

JAMES BRITTEN, F.L.S.,

British Museum (Natural History), South Kensington.

CONTENTS.

PAGE

On the Jamaica Ferns of Sloane's Herbarium. By G. S. Jenman, F.L.S. (Concluded) 33

On the relation of the British forms of Rubi to the Continental types. By J. G. Baker, F.R.S. (Continued) 43

Irish Hawkweeds. By H. C. Hart 47

Hookera v. Brodiæa: with some remarks on nomenclature. By James Britten, F.L.S. 49

A New Chinese *Amomum*. By H. F. Hance, Ph. D., F.L.S., &c. .. 53

Short Note. — *Equisetum litorale* Kühlewein, in Britain 54

Notices of Books:—

The Illustrated Dictionary of Gardening; a Practical and Scientific Encyclopædia of Horticulture for Gardeners and Botanists. Edited by George Nicholson, of the Royal Botanic Gardens, Kew 55

Phanerogamæ Cumingianæ Philippinarum; o Indice numèrico y Catalogo sistematico de las Plantas Fanerogamas coleccionadas en Filipinas por H. Cuming; con caracteristicas de algunas especies no descritas y del género Cumingia (Malváceas). Por D. Sebastian Vidal y Soler 57

New Books 60

Articles in Journals 61

Obituary 62

LONDON:

WEST, NEWMAN & CO., 54, HATTON GARDEN, E.C.

DULAU & CO., SOHO SQUARE.

Price One Shilling and Threepence.

NOTICE.

The JOURNAL OF BOTANY is printed and published by WEST, NEWMAN & Co., 54, Hatton Garden, London, E.C., to whom Subscriptions for 1886 (in advance, Twelve Shillings; if not paid in advance, chargeable at the rate of 1s. 3d. per number) should be paid. Post-Office Orders may be drawn on the Hatton Garden Office.

The Volume for 1885 (price 16s. 6d., bound in cloth) is now ready; also covers for the Volume (price 1s. 2d. post free).

The Volumes for 1883 and 1884 can still be had.

For Volumes and back numbers for 1872—82 application should be made to DULAU & Co., Soho Square, W.

The Editor will be glad to send the JOURNAL OF BOTANY in exchange for other Journals of a similar character. Such Journals, books for review, and communications intended for publication, to be addressed to JAMES BRITTEN, Esq., 18, West Square, Southwark, S.E.

He will be greatly obliged to the Secretaries of Local Natural History Societies if they will forward him copies of their Transactions, so that any paper of botanical interest may be recorded in this Journal.

TERMS FOR ADVERTISEMENTS.

Whole page	£2	0	0	Quarter page	0	15	0
Half page	1	5	0	Six lines and under	0	5	0

Every additional line, 9d.

A liberal reduction is made for a series.

To be sent to WEST, NEWMAN & Co., 54, Hatton Garden, not later than the 24th of each month.

AUTHOR'S SEPARATE COPIES.

Authors who require copies of their articles are requested to order separate copies from the Publishers, and to notify this and state the number required at head of their MS.; otherwise the type may be distributed before the order is received. By the buying of additional copies of the Journal sets are destroyed. The charges for separate copies are as under :—

2 pages	25	copies	4s.	4 pages	25	copies	5s.	8 pages	25	copies	8s. 0d.
,,	50	,,	5s.	,,	50	,,	6s.	,,	50	,,	9s. 0d.
,,	100	,,	7s.	,,	100	,,	8s.	,,	100	,,	10s. 6d.

A greater number of pages to be charged in equal proportion. Separate Titles, Wrappers, &c., extra.

Annual Subscription, paid in advance, Twelve Shillings, post free within the Postal Union. Single Numbers, 1s. 3d.

No. 279. MARCH, 1886. Vol. XXIV.

THE JOURNAL OF BOTANY

BRITISH AND FOREIGN.

EDITED BY

JAMES BRITTEN, F.L.S.,

British Museum (Natural History), South Kensington.

CONTENTS.

	PAGE
A British Moss new to Science. By G. A. Holt. (Tab. 265)	65
Prof. J. Philippi's Researches in Chili. By John Ball, F.R.S.	65
Recent Additions to the Flora of Iceland. By Arthur Bennett, F.L.S.	67
On the relation of the British forms of Rubi to the Continental types. By J. G. Baker, F.R.S. (Concluded)	71
On the Flora of the Upper Tamar and Neighbouring Districts. By the Rev. W. Moyle Rogers, F.L.S. (Continued)	78
Notes on *Lightia* and *Erisma*. By B. Clarke, F.L.S.	82
Short Notes.—*Helleborus fœtidus* in Glamorganshire.—Irish *Hieracia*.—*Naias flexilis* Rostk. at Killarney.—*Hieracia* Notes.—Caithness Botany	83
Notices of Books:—	
Flore complète de la Belgique: espèces indigènes et plantes cultivées sans abri. Par André de Vos	85
The Orchid-Grower's Manual, containing descriptions of the best Species and Varieties of Orchidaceous Plants. By B. S. Williams	87
Report on the Progress of the Botanical Gardens at Saháranpur and Mussoorie for the year ending 31st March, 1885. [By J. F. Duthie, Superintendent]	88
Short Notices	88
New Books	90
Articles in Journals	91
Linnean Society of London	92
Botanical News	96

LONDON:

WEST, NEWMAN & CO., 54, HATTON GARDEN, E.C.

DULAU & CO., SOHO SQUARE.

Price One Shilling and Threepence.

NOTICE.

The JOURNAL OF BOTANY is printed and published by WEST, NEWMAN & Co., 54, Hatton Garden, London, E.C., to whom Subscriptions for 1886 (in advance, Twelve Shillings; if not paid in advance, chargeable at the rate of 1s. 3d. per number) should be paid. Post-Office Orders may be drawn on the Hatton Garden Office.

The Volume for 1885 (price 16s. 6d., bound in cloth) is now ready; also covers for the Volume (price 1s. 2d. post free).

The Volumes for 1883 and 1884 can still be had.

For Volumes and back numbers for 1872—82 application should be made to DULAU & Co., Soho Square, W.

The Editor will be glad to send the JOURNAL OF BOTANY in exchange for other Journals of a similar character. Such Journals, books for review, and communications intended for publication, to be addressed to JAMES BRITTEN, Esq., 18, West Square, Southwark, S.E.

He will be greatly obliged to the Secretaries of Local Natural History Societies if they will forward him copies of their Transactions, so that any paper of botanical interest may be recorded in this Journal.

TERMS FOR ADVERTISEMENTS.

Whole page	£2	0	0	Quarter page	0	15	0
Half page	1	5	0	Six lines and under	0	5	0

Every additional line, 9d.

A liberal reduction is made for a series.

To be sent to WEST, NEWMAN & Co., 54, Hatton Garden, not later than the 24th of each month.

AUTHOR'S SEPARATE COPIES.

Authors who require copies of their articles are requested to order separate copies from the Publishers, and to notify this and state the number required at head of their MS.; otherwise the type may be distributed before the order is received. By the buying of additional copies of the Journal sets are destroyed. The charges for separate copies are as under:—

2 pages	25	copies	4s.	4 pages	25	copies	5s.	8 pages	25	copies	8s. 0d.
"	50	"	5s.	"	50	"	6s.	"	50	"	9s. 0d.
"	100	"	7s.	"	100	"	8s.	"	100	"	10s. 6d.

A greater number of pages to be charged in equal proportion. Separate Titles, Wrappers, &c., extra.

THE GARDEN:

A WEEKLY ILLUSTRATED JOURNAL OF HORTICULTURE IN ALL ITS BRANCHES.

Price Fourpence.

"Mr. Robinson's valuable and elegant weekly."—*The Saturday Review.*

The following are some of the subjects regularly discussed in THE GARDEN:—Hardy Flowers, the Conservatory, Town Gardens, the Wild Garden, the Greenhouse and Stove, Public Gardens, the Kitchen Garden, the Household, the Flower Garden, Landscape Gardening, the Fruit Garden, Garden Structures, Room and Window Gardens, Notes and Questions, Market Gardening, Trees and Shrubs, Garden Implements, and Appliances of all kinds.

Terms of Subscription.—Sent direct from the Office in London, post-free, payable in advance—For One Year, 19s. 6d.: Half a Year, 9s. 9d.: Quarter of a Year, 5s.

37, SOUTHAMPTON STREET, COVENT GARDEN, W.C.

THE BOTANICAL MAGAZINE.

THIRD SERIES.

Coloured Figures and Descriptions of New and Rare Plants of interest to the Botanical Student, and available for the Garden, Stove, or Greenhouse. By Sir J. D. HOOKER, C.B., F.R.S., F.L.S., &c.

Monthly, with six Coloured Plates, 3s. 6d. *Annual Subscription*, 12s.

L. REEVE & CO., 5, HENRIETTA STREET, COVENT GARDEN.

NATURE:

A WEEKLY ILLUSTRATED JOURNAL OF SCIENCE.

One of the leading objects of this periodical is to awaken in the public mind a more lively interest in Science. With this end in view it provides original Articles and Reviews, written by scientific men of the highest distinction in their various departments, expounding in a popular and yet authentic manner the grand results of scientific research, discussing the most recent scientific discoveries, and pointing out the bearing of Science upon Civilization and progress, and its claims to more general recognition, as well as to a higher place in the educational system of the country.

Published every Thursday, price 6d. Yearly Subscription, 28s.; Half-yearly, 14s. 6d.; Quarterly, 7s. 6d. Post-Office Orders to be made payable at King Street, Covent Garden, W.C.

MACMILLAN & CO., Bedford Street, Strand, W.C.

BOTANICAL DRYING PAPER

FOR DRYING FLOWERING PLANTS, FERNS, AND SEA-WEEDS.

Preserves form and colour in the best possible manner. Used by the Naturalists on board the Arctic ships, and also on the cruise of H.M.S. 'Challenger.'

16 in.	by	10	when folded,	15s.	per ream,	1s. 1d.	per quire.
18	,,	11	,,	19s.	,,	1s. 4d.	,,
20	,,	12	,,	23s.	,,	1s. 9d.	,,
20	,,	16	,,	30s.	,,	2s. 2d.	,,

☞ This Paper is too heavy to send by Post.

WEST, NEWMAN & CO., 54, HATTON GARDEN, LONDON.

PRINGLE'S PLANTÆ MEXICANÆ, 1885. — The Subscriber, having undertaken to travel year by year in Northern Mexico and collect for Herbaria a good representation of its Flora, now offers his first Collection, Sets of 400 Species, for 32 Dols. He can assure his numerous Patrons in Europe that the quality of specimens of these sets is equal to that of his former distributions from the South-western United States and adjacent Mexico; and to those whose support he solicits he would say that the specimens have been selected and prepared with care, that they have been made as complete as possible, and that the amount of material is liberal. The Collection includes the usual proportion of New Species. Lists supplied.

C. G. PRINGLE, Charlotte, Vermont, U.S.A.

Just published: Post Free for Two Stamps,

NATURAL HISTORY AND SCIENTIFIC BOOK CIRCULAR, No. 70. — ZOOLOGY, BOTANY, PALÆONTOLOGY. Recent Purchases and New Works.

WILLIAM WESLEY & SON, 28, Essex Street, Strand, London, W.C.

Will be published on November the 10th.

JOHN WHELDON'S BOTANICAL CATALOGUE. PART II.— Containing Lichens, Mosses, Agriculture, &c. Sent post free, two stamps.

JOHN WHELDON, 58, Great Queen Street, London, W.C.

ESTABLISHED 1851.

BIRKBECK BANK.—Southampton Buildings, Chancery Lane. THREE per CENT. INTEREST allowed on DEPOSITS, repayable on demand.

TWO per CENT. INTEREST allowed on CURRENT ACCOUNTS, calculated on the minimum monthly balances, when not drawn below £50.

The Bank undertakes for its Customers, free of charge, the custody of Deeds, Writings, and other Securities and Valuables; the collection of Bills of Exchange, Dividends, and Coupons; and the purchase and sale of Stocks, Shares, and Annuities.

The BIRKBECK ALMANACK, with full particulars, can be obtained post free, on application to

FRANCIS RAVENSCROFT, Manager.

March 31st, 1884.

The Birkbeck Building Society's Annual Receipts exceed Five Millions.

HOW TO PURCHASE A HOUSE FOR TWO GUINEAS PER MONTH, with immediate Possession and no Rent to pay. Apply at the Office of the BIRKBECK BUILDING SOCIETY.

HOW TO PURCHASE A PLOT OF LAND FOR FIVE SHILLINGS PER MONTH. with immediate possession, either for Building or Gardening purposes. Apply at the Office of the BIRKBECK FREEHOLD LAND SOCIETY. A Pamphlet, with full particulars, on application.

FRANCIS RAVENSCROFT, Manager.

Southampton Buildings, Chancery Lane.

On the 1st of each Month, price Sixpence,

THE ENTOMOLOGIST:

AN ILLUSTRATED JOURNAL OF GENERAL ENTOMOLOGY.

Edited by JOHN T. CARRINGTON, F.L.S., with the assistance of FREDERICK BOND, F.Z.S., F.E.S., EDWARD A. FITCH, F.L.S., F.E.S., JOHN A. POWER, M.D., RICHARD SOUTH, F.E.S., J. JENNER WEIR, F.L.S., F.Z.S., V.-P.E.S., F. BUCHANAN WHITE, M.D., F.L.S., F.E.S.

SIMPKIN, MARSHALL & Co., Stationers' Hall Court.

LONDON: WEST NEWMAN AND CO., 54, HATTON GARDEN, E.C.

THE GARDEN:

A Weekly Illustrated Journal of Horticulture in all its Branches.

Price Fourpence.

"Mr. Robinson's valuable and elegant weekly."—*The Saturday Review.*

The following are some of the subjects regularly discussed in The Garden:—Hardy Flowers, the Conservatory, Town Gardens, the Wild Garden, the Greenhouse and Stove, Public Gardens, the Kitchen Garden, the Household, the Flower Garden, Landscape Gardening, the Fruit Garden, Garden Structures, Room and Window Gardens, Notes and Questions, Market Gardening, Trees and Shrubs, Garden Implements, and Appliances of all kinds.

Terms of Subscription.—Sent direct from the Office in London, post-free, payable in advance—For One Year, 19s. 6d.: Half a Year, 9s. 9d.; Quarter of a Year, 5s.

37, SOUTHAMPTON STREET, COVENT GARDEN, W.C.

THE BOTANICAL MAGAZINE,

THIRD SERIES.

Coloured Figures and Descriptions of New and Rare Plants of interest to the Botanical Student, and available for the Garden, Stove, or Greenhouse. By Sir J. D. Hooker, C.B., F.R.S., F.L.S., &c.

Monthly, with six Coloured Plates, 3s. 6d. Annual Subscription, 42s.

L. REEVE & CO., 5, HENRIETTA STREET, COVENT GARDEN.

NATURE:

A WEEKLY ILLUSTRATED JOURNAL OF SCIENCE.

One of the leading objects of this periodical is to awaken in the public mind a more lively interest in Science. With this end in view it provides original Articles and Reviews, written by scientific men of the highest distinction in their various departments, expounding in a popular and yet authentic manner the grand results of scientific research, discussing the most recent scientific discoveries, and pointing out the bearing of Science upon Civilization and progress, and its claims to more general recognition, as well as to a higher place in the educational system of the country.

Published every Thursday, price 6d. Yearly Subscription, 28s.; Half-yearly, 14s. 6d.: Quarterly, 7s. 6d. Post-Office Orders to be made payable at King Street, Covent Garden, W.C.

MACMILLAN & CO., Bedford Street, Strand, W.C.

BOTANICAL DRYING PAPER

FOR DRYING FLOWERING PLANTS, FERNS, AND SEA-WEEDS.

Preserves form and colour in the best possible manner. Used by the Naturalists on board the Arctic ships, and also on the cruise of H.M.S. 'Challenger.'

16 in.	by	10	when folded,	15s.	per ream,	1s. 1d.	per quire.
18	,,	11	,,	19s.	,,	1s. 4d.	,,
20	,,	12	,,	25s.	,,	1s. 9d.	,,
20	,,	16	,,	30s.	,,	2s. 2d.	,,

☞ This Paper is too heavy to send by Post.

PETER NEWMAN & CO., 54, HATTON GARDEN, LONDON.

PRINGLE'S PLANTÆ MEXICANÆ, 1885. — The Subscriber, having undertaken to travel year by year in Northern Mexico and collect for Herbaria a good representation of its Flora, now offers his first Collection, Sets of 400 Species, for 32 Dols. He can assure his numerous Patrons in Europe that the quality of specimens of these sets is equal to that of his former distributions from the South-western United States and adjacent Mexico; and to those whose support he solicits he would say that the specimens have been selected and prepared with care, that they have been made as complete as possible, and that the amount of material is liberal. The Collection includes the usual proportion of New Species. Lists supplied.

C. G. Pringle, Charlotte, Vermont, U.S.A.

LEHRER BRÄUKER in BARMEN verkäuft billig
6000 PHANEROGAMEN und 300 CRYPTOGAMEN.

Just published: Post Free for Two Stamps,

NATURAL HISTORY AND SCIENTIFIC BOOK CIRCULAR, No. 70. — ZOOLOGY, BOTANY, PALÆONTOLOGY. Recent Purchases and New Works.

William Wesley & Son, 28, Essex Street, Strand, London, W.C.

Will be published on November the 10th.

JOHN WHELDON'S BOTANICAL CATALOGUE. Part II. — Containing Lichens, Mosses, Agriculture, &c. Sent post free, two stamps.

John Wheldon, 58, Great Queen Street, London, W.C.

ESTABLISHED 1851.

BIRKBECK BANK. — Southampton Buildings, Chancery Lane.
THREE per CENT. INTEREST allowed on DEPOSITS, repayable on demand.
TWO per CENT. INTEREST allowed on CURRENT ACCOUNTS, calculated on the minimum monthly balances, when not drawn below £50.
The Bank undertakes for its Customers, free of charge, the custody of Deeds, Writings, and other Securities and Valuables; the collection of Bills of Exchange, Dividends, and Coupons: and the purchase and sale of Stocks, Shares, and Annuities.
The BIRKBECK ALMANACK, with full particulars, can be obtained post free, on application to
FRANCIS RAVENSCROFT, Manager.
March 31st, 1884.

The Birkbeck Building Society's Annual Receipts exceed Five Millions.

HOW TO PURCHASE A HOUSE FOR TWO GUINEAS PER MONTH, with immediate Possession and no Rent to pay. Apply at the Office of the Birkbeck Building Society.

HOW TO PURCHASE A PLOT OF LAND FOR FIVE SHILLINGS PER MONTH. with immediate possession, either for Building or Gardening purposes. Apply at the Office of the Birkbeck Freehold Land Society. A Pamphlet, with full particulars, on application.
FRANCIS RAVENSCROFT, Manager.
Southampton Buildings, Chancery Lane.

LONDON: WEST NEWMAN AND CO., 54, HATTON GARDEN, E.C.

THE GARDEN:

A WEEKLY ILLUSTRATED JOURNAL OF HORTICULTURE IN ALL ITS BRANCHES.

Price Fourpence.

"Mr. Robinson's valuable and elegant weekly."—*The Saturday Review.*

The following are some of the subjects regularly discussed in THE GARDEN:—Hardy Flowers, the Conservatory, Town Gardens, the Wild Garden, the Greenhouse and Stove, Public Gardens, the Kitchen Garden, the Household, the Flower Garden, Landscape Gardening, the Fruit Garden, Garden Structures, Room and Window Gardens, Notes and Questions, Market Gardening, Trees and Shrubs, Garden Implements, and Appliances of all kinds.

Terms of Subscription.—Sent direct from the Office in London, post-free, payable in advance—For One Year, 19s. 6d.; Half a Year, 9s. 9d.; Quarter of a Year, 5s.

37, SOUTHAMPTON STREET, COVENT GARDEN, W.C.

THE BOTANICAL MAGAZINE.

THIRD SERIES.

Coloured Figures and Descriptions of New and Rare Plants of interest to the Botanical Student, and available for the Garden, Stove, or Greenhouse. By Sir J. D. HOOKER, C.B., F.R.S., F.L.S., &c.

Monthly, with six Coloured Plates, 3s. 6d. *Annual Subscription,* 42s.

L. REEVE & CO., 5, HENRIETTA STREET, COVENT GARDEN.

NATURE:

A WEEKLY ILLUSTRATED JOURNAL OF SCIENCE.

One of the leading objects of this periodical is to awaken in the public mind a more lively interest in Science. With this end in view it provides original Articles and Reviews, written by scientific men of the highest distinction in their various departments, expounding in a popular and yet authentic manner the grand results of scientific research, discussing the most recent scientific discoveries, and pointing out the bearing of Science upon Civilization and progress, and its claims to more general recognition, as well as to a higher place in the educational system of the country.

Published every Thursday, price 6d. Yearly Subscription, 28s.; Half-yearly, 14s. 6d.; Quarterly, 7s. 6d. Post-Office Orders to be made payable at King Street, Covent Garden, W.C.

MACMILLAN & CO., Bedford Street, Strand, W.C.

BOTANICAL DRYING PAPER

FOR DRYING FLOWERING PLANTS, FERNS, AND SEA-WEEDS.

Preserves form and colour in the best possible manner. Used by the Naturalists on board the Arctic ships, and also on the cruise of H.M.S. 'Challenger.'

16 in.	by	10	when folded,	15s.	per ream,	1s. 1d.	per quire.
18	,,	11	,,	19s.	,,	1s. 4d.	,,
20	,,	12	,,	23s.	,,	1s. 9d.	,,
20	,,	16	,,	30s.	,,	2s. 2d.	,,

☞ This Paper is too heavy to send by Post.

WEST, NEWMAN & CO., 54, HATTON GARDEN, LONDON.

Vient de paraître :

EPILOBIUM GENUS

A cl. Ch. Cuisin illustratum

AUSPICE **WILLIAM BARBEY.**

1 VOL. IN-FOLIO AVEC 24 PLANCHES. CARTONNÉ ÉLÉGAMMENT.—**PRIX : 25 FRANCS.**

EN VENTE CHEZ GEORGES BRIDEL, ÉDITEUR À LAUSANNE,

Et chez les principaux libraires de la Suisse et de l'étranger.

Vient de paraître

CHEZ GEORGES BRIDEL, ÉDITEUR À LAUSANNE,

FLORÆ SARDOÆ COMPENDIUM

CATALOGUE RAISONNÉ

DES VÉGÉTAUX OBSERVÉS DANS L'ÎSLE DE SARDAIGNE,

Dressé par **WILLIAM BARBEY,**

Avec supplément par *P. Ascherson* et *E. Levier.*

1 VOLUME IN-FOLIO AVEC 7 PLANCHES. — PRIX : 25 FRANCS.

En vente chez l'éditeur et chez les principaux libraires de la Suisse et de l'étranger.

Just Published, Free by Post for Three Stamps.

NATURAL HISTORY AND SCIENTIFIC BOOK CIRCULAR. No. 71. — Containing Valuable Works on BOTANY (General, Fossil, and Cryptogamic Botany), Local and Foreign Floras, Medical and Economic Botany, Trees and Forestry.

WILLIAM WESLEY & SON, 28, Essex Street, Strand, London, W.C.

ESTABLISHED 1851.

BIRKBECK BANK.—Southampton Buildings, Chancery Lane.
THREE per CENT. INTEREST allowed on DEPOSITS, repayable on demand.
TWO per CENT. INTEREST allowed on CURRENT ACCOUNTS, calculated on the minimum monthly balances, when not drawn below £100.

The Bank undertakes for its Customers, free of charge, the custody of Deeds, Writings, and other Securities and Valuables; the collection of Bills of Exchange, Dividends, and Coupons; and the purchase and sale of Stocks, Shares, and Annuities.

The BIRKBECK ALMANACK, with full particulars, can be obtained post free, on application to FRANCIS RAVENSCROFT, Manager.

March 31st, 1884.

The Birkbeck Building Society's Annual Receipts exceed Five Millions.

HOW TO PURCHASE A HOUSE FOR TWO GUINEAS PER MONTH, with immediate Possession and no Rent to pay. Apply at the Office of the BIRKBECK BUILDING SOCIETY.

HOW TO PURCHASE A PLOT OF LAND FOR FIVE SHILLINGS PER MONTH, with immediate possession, either for Building or Gardening purposes. Apply at the Office of the BIRKBECK FREEHOLD LAND SOCIETY. A Pamphlet, with full particulars, on application. FRANCIS RAVENSCROFT, Manager.

Southampton Buildings, Chancery Lane.

LONDON : WEST NEWMAN AND CO., 54, HATTON GARDEN, E.C.

Annual Subscription, paid in advance, Twelve Shillings, post free within the Postal Union. Single Numbers, 1s. 3d.

No. 281. MAY, 1886. Vol. XXIV.

THE JOURNAL OF BOTANY BRITISH AND FOREIGN.

EDITED BY

JAMES BRITTEN, F.L.S.,

British Museum (Natural History), South Kensington.

CONTENTS.

PAGE

New or Noteworthy Fungi:—Part III. By W. B. Grove. B.A. (Plates 266 & 267) 129

George Jackson, F.L.S. By James Britten, F.L.S. 137

The Distribution of *Potamogeton* in Britain. By Arthur Bennett, F.L.S. 139

On *Sparganium neglectum*. By W. H. Beeby 142

On the Flora of the Upper Tamar and Neighbouring Districts. By the Rev. W. Moyle Rogers, F.L.S. (Continued) 144

Short Notes. — Botany of Caithness and Sutherland. — *Carex helvola* Blytt in Britain 148

Notices of Books:—

Gray's Botanical Text-book. Vol. II. Physiological Botany, by Geo. Lincoln Goodale, A.M., M.D. 149

Handbook of Mosses. By J. E. Bagnall 151

List of Seeds of Hardy Annual and Perennial Plants grown in the Royal Gardens, Kew .. 151

The Tourist's Guide to the Flora of the Alps. By Prof. K. W. v. Dalla-Torre. Translated and edited by A. W. Bennett, M.A. 154

Short Notices 154

New Books 155

Articles in Journals 155

Linnean Society of London 157

Obituary 159

LONDON:

WEST, NEWMAN & CO., 54, HATTON GARDEN, E.C.

DULAU & CO., SOHO SQUARE.

Price One Shilling and Threepence.

NOTICE.

The JOURNAL OF BOTANY is printed and published by WEST, NEWMAN & Co., 54, Hatton Garden, London, E.C., to whom Subscriptions for 1886 (in advance, Twelve Shillings; if not paid in advance, chargeable at the rate of 1s. 3d. per number) should be paid. Post-Office Orders may be drawn on the Hatton Garden Office.

The Volume for 1885 (price 16s. 6d., bound in cloth) is now on sale; also covers for the Volume (price 1s. 2d. post free).

The Volumes for 1883 and 1884 can still be had.

For Volumes and back numbers for 1872—82 application should be made to DULAU & Co., Soho Square, W.

The Editor will be glad to send the JOURNAL OF BOTANY in exchange for other Journals of a similar character. Such Journals, books for review, and communications intended for publication, to be addressed to JAMES BRITTEN, Esq., 18, West Square, Southwark, S.E.

He will be greatly obliged to the Secretaries of Local Natural History Societies if they will forward him copies of their Transactions, so that any paper of botanical interest may be recorded in this Journal.

TERMS FOR ADVERTISEMENTS.

Whole page	£2	0	0	Quarter page	0	15	0
Half page	1	5	0	Six lines and under	0	5	0

Every additional line, 9d.

A liberal reduction is made for a series.

To be sent to WEST, NEWMAN & Co., 54, Hatton Garden, not later than the 24th of each month.

AUTHOR'S SEPARATE COPIES.

Authors who require copies of their articles are requested to order separate copies from the Publishers, and to notify this and state the number required at head of their MS.; otherwise the type may be distributed before the order is received. By the buying of additional copies of the Journal sets are destroyed. The charges for separate copies are as under :—

2 pages	25	copies	4s.	4 pages	25	copies	5s.	8 pages	25	copies	8s. 0d.
,,	50	,,	5s.	,,	50	,,	6s.	,,	50	,,	9s. 0d.
,,	100	,,	7s.	,,	100	,,	8s.	,,	100	,,	10s. 6d.

A greater number of pages to be charged in equal proportion. Separate Titles, Wrappers, &c., extra.

Annual Subscription, paid in advance, Twelve Shillings, post free within the Postal Union. Single Numbers, 1s. 3d.

No. 280. APRIL, 1886. Vol. XXIV.

THE JOURNAL OF BOTANY

BRITISH AND FOREIGN.

EDITED BY

JAMES BRITTEN, F.L.S.,

British Museum (Natural History), South Kensington.

CONTENTS.

	PAGE
A Synopsis of the *Rhizocarpeæ*. By J. G. Baker, F.R.S., F.L.S. ..	97
John Zier, F.L.S. By Jas. Britten, F.L.S.	101
On the Flora of the Upper Tamar and Neighbouring Districts. By the Rev. W. Moyle Rogers, F.L.S. (Continued)	104
Short Notes. — *Rosa Ripartii* Déséglise in Britain. — The Labelling of Alien Species. — Notes on East Norfolk Plants. — New Glamorgan Plants. — *Polypodium Phegopteris* in West Sussex. — Note on *Utricularia*	111
New Phanerogams published in Great Britain and Ireland during 1885	113
Notices of Books:—	
Hepaticæ Amazonicæ et Andinæ, decerpsit unperiusque descripsit Richard Spruce	122
Short Notices	124
New Books	124
Articles in Journals	125
Linnean Society of London	126
Obituary	128

LONDON:

WEST, NEWMAN & CO., 54, HATTON GARDEN, E.C.

DULAU & CO., SOHO SQUARE.

Price One Shilling and Threepence.

NOTICE.

The JOURNAL OF BOTANY is printed and published by WEST, NEWMAN & Co., 54, Hatton Garden, London, E.C., to whom Subscriptions for 1886 (in advance, Twelve Shillings; if not paid in advance, chargeable at the rate of 1s. 3d. per number) should be paid. Post-Office Orders may be drawn on the Hatton Garden Office.

The Volume for 1885 (price 16s. 6d., bound in cloth) is now on sale; also covers for the Volume (price 1s. 2d. post free).

The Volumes for 1883 and 1884 can still be had.

For Volumes and back numbers for 1872—82 application should be made to DULAU & Co., Soho Square, W.

The Editor will be glad to send the JOURNAL OF BOTANY in exchange for other Journals of a similar character. Such Journals, books for review, and communications intended for publication, to be addressed to JAMES BRITTEN, Esq., 18, West Square, Southwark, S.E.

He will be greatly obliged to the Secretaries of Local Natural History Societies if they will forward him copies of their Transactions, so that any paper of botanical interest may be recorded in this Journal.

TERMS FOR ADVERTISEMENTS.

Whole page	£2	0	0	Quarter page	0	15	0
Half page	1	5	0	Six lines and under	0	5	0

Every additional line, 9d.

A liberal reduction is made for a series.

To be sent to WEST, NEWMAN & Co., 54, Hatton Garden, not later than the 24th of each month.

AUTHOR'S SEPARATE COPIES.

Authors who require copies of their articles are requested to order separate copies from the Publishers, and to notify this and state the number required at head of their MS.; otherwise the type may be distributed before the order is received. By the buying of additional copies of the Journal sets are destroyed. The charges for separate copies are as under :—

2 pages	25	copies	4s.	4 pages	25	copies	5s.	8 pages	25	copies	8s. 0d.
,,	50	,,	5s.	,,	50	,,	6s.	,,	50	,,	9s. 0d.
,,	100	,,	7s.	,,	100	,,	8s.	,,	100	,,	10s. 6d.

A greater number of pages to be charged in equal proportion. Separate Titles, Wrappers, &c., extra.

A New (Eighth) Edition of the

LONDON CATALOGUE OF BRITISH PLANTS,

containing numerous alterations and additions, will be ready during the first week of May. Price 6*d.*; on stouter paper and bound in limp cloth, 1*s.*

GENERIC INDEX only, printed on a Card for use as a Guide to the Herbarium, 2*d.*

LONDON: GEORGE BELL & SONS, York Street, Covent Garden, W.C.

THE GARDEN:

A WEEKLY ILLUSTRATED JOURNAL OF HORTICULTURE IN ALL ITS BRANCHES.

Price Fourpence.

"Mr. Robinson's valuable and elegant weekly."—*The Saturday Review.*

The following are some of the subjects regularly discussed in THE GARDEN:—Hardy Flowers, the Conservatory, Town Gardens, the Wild Garden, the Greenhouse and Stove, Public Gardens, the Kitchen Garden, the Household, the Flower Garden, Landscape Gardening, the Fruit Garden, Garden Structures, Room and Window Gardens, Notes and Questions, Market Gardening, Trees and Shrubs, Garden Implements, and Appliances of all kinds.

Terms of Subscription.—Sent direct from the Office in London, post-free, payable in advance—For One Year, 19s. 6d.; Half a Year, 9s. 9d.; Quarter of a Year, 5s.

37, SOUTHAMPTON STREET, COVENT GARDEN, W.C.

NATURE:

A WEEKLY ILLUSTRATED JOURNAL OF SCIENCE.

One of the leading objects of this periodical is to awaken in the public mind a more lively interest in Science. With this end in view it provides original Articles and Reviews, written by scientific men of the highest distinction in their various departments, expounding in a popular and yet authentic manner the grand results of scientific research, discussing the most recent scientific discoveries, and pointing out the bearing of Science upon Civilization and progress, and its claims to more general recognition, as well as to a higher place in the educational system of the country.

Published every Thursday, price 6d. Yearly Subscription, 28s.; Half-yearly, 14s. 6d.: Quarterly, 7s. 6d. Post-Office Orders to be made payable at King Street, Covent Garden, W.C.

MACMILLAN & CO., Bedford Street, Strand, W.C.

BOTANICAL DRYING PAPER

FOR DRYING FLOWERING PLANTS, FERNS, AND SEA-WEEDS.

Preserves form and colour in the best possible manner. Used by the Naturalists on board the Arctic ships, and also on the cruise of H.M.S. 'Challenger.'

16 in.	by	10	when folded,	15*s.*	per ream,	1*s.* 1*d.*	per quire.
18	,,	11	,,	19*s.*	,,	1*s.* 4*d.*	,,
20	,,	12	,,	23*s.*	,,	1*s.* 9*d.*	,,
20	,,	16	,,	30*s.*	,,	2*s.* 2*d.*	,,

☞ This Paper is too heavy to send by Post.

WEST, NEWMAN & CO., 54, HATTON GARDEN, LONDON.

Vient de paraître :

EPILOBIUM GENUS

A cl. Ch. Cuisin illustratum

AUSPICE **WILLIAM BARBEY.**

1 VOL. IN-FOLIO AVEC 24 PLANCHES. CARTONNÉ ÉLÉGAMMENT.—PRIX : 25 FRANCS.

EN VENTE CHEZ GEORGES BRIDEL, ÉDITEUR À LAUSANNE,

Et chez les principaux libraires de la Suisse et de l'étranger.

Vient de paraître

CHEZ GEORGES BRIDEL, ÉDITEUR À LAUSANNE,

FLORÆ SARDOÆ COMPENDIUM

CATALOGUE RAISONNÉ

DES VÉGÉTAUX OBSERVÉS DANS L'ÎSLE DE SARDAIGNE,

Dressé par **WILLIAM BARBEY,**

Avec supplément par *P. Ascherson* et *E. Levier.*

1 VOLUME IN-FOLIO AVEC 7 PLANCHES. — PRIX : 25 FRANCS.

En vente chez l'éditeur et chez les principaux libraires de la Suisse et de l'étranger.

Just Published, Free by Post for Three Stamps.

NATURAL HISTORY AND SCIENTIFIC BOOK CIRCULAR No. 71. — Containing Valuable Works on BOTANY (General, Fossil, and Cryptogamic Botany), Local and Foreign Floras, Medical and Economic Botany, Trees and Forestry.

WILLIAM WESLEY & SON, 28, Essex Street, Strand, London, W.C.

ESTABLISHED 1851.

BIRKBECK BANK.—Southampton Buildings, Chancery Lane. THREE per CENT. INTEREST allowed on DEPOSITS, repayable on demand. TWO per CENT. INTEREST allowed on CURRENT ACCOUNTS, calculated on the minimum monthly balances, when not drawn below £100.

The Bank undertakes for its Customers, free of charge, the custody of Deeds, Writings, and other Securities and Valuables; the collection of Bills of Exchange, Dividends, and Coupons; and the purchase and sale of Stocks, Shares, and Annuities.

The BIRKBECK ALMANACK, with full particulars, can be obtained post free, on application to

FRANCIS RAVENSCROFT, Manager.

March 31*st*, 1884.

The Birkbeck Building Society's Annual Receipts exceed Five Millions.

HOW TO PURCHASE A HOUSE FOR TWO GUINEAS PER MONTH, with immediate Possession and no Rent to pay. Apply at the Office of the BIRKBECK BUILDING SOCIETY.

HOW TO PURCHASE A PLOT OF LAND FOR FIVE SHILLINGS PER MONTH, with immediate possession, either for Building or Gardening purposes. Apply at the Office of the BIRKBECK FREEHOLD LAND SOCIETY. A Pamphlet, with full particulars, on application.

FRANCIS RAVENSCROFT, Manager.

Southampton Buildings, Chancery Lane.

LONDON: WEST NEWMAN AND CO., 54, HATTON GARDEN, E.C.

A New (Eighth) Edition of the

LONDON CATALOGUE OF BRITISH PLANTS

containing numerous alterations and additions, is now ready. Price *6d.*; on stouter paper and bound in limp cloth, 1*s.*

GENERIC INDEX only, printed on a Card for use as a Guide to the Herbarium, *2d.*

LONDON: GEORGE BELL & SONS, York Street, Covent Garden, W.C.

THE GARDEN:

A WEEKLY ILLUSTRATED JOURNAL OF HORTICULTURE IN ALL ITS BRANCHES.

Price Fourpence.

"Mr. Robinson's valuable and elegant weekly."—*The Saturday Review.*

The following are some of the subjects regularly discussed in THE GARDEN:—Hardy Flowers, the Conservatory, Town Gardens, the Wild Garden, the Greenhouse and Stove, Public Gardens, the Kitchen Garden, the Household, the Flower Garden, Landscape Gardening, the Fruit Garden, Garden Structures, Room and Window Gardens, Notes and Questions, Market Gardening, Trees and Shrubs, Garden Implements, and Appliances of all kinds.

Terms of Subscription.—Sent direct from the Office in London, post-free, payable in advance—For One Year, 19s. 6d.; Half a Year, 9s. 9d.; Quarter of a Year, 5s.

37, SOUTHAMPTON STREET, COVENT GARDEN, W.C.

NATURE:

A WEEKLY ILLUSTRATED JOURNAL OF SCIENCE.

One of the leading objects of this periodical is to awaken in the public mind a more lively interest in Science. With this end in view it provides original Articles and Reviews, written by scientific men of the highest distinction in their various departments, expounding in a popular and yet authentic manner the grand results of scientific research, discussing the most recent scientific discoveries, and pointing out the bearing of Science upon Civilization and progress, and its claims to more general recognition, as well as to a higher place in the educational system of the country.

Published every Thursday, price 6d. Yearly Subscription, 28s.; Half-yearly, 14s. 6d.: Quarterly, 7s. 6d. Post-Office Orders to be made payable at King Street, Covent Garden, W.C.

MACMILLAN & CO., Bedford Street, Strand, W.C.

BOTANICAL DRYING PAPER

FOR DRYING FLOWERING PLANTS, FERNS, AND SEA-WEEDS.

Preserves form and colour in the best possible manner. Used by the Naturalists on board the Arctic ships, and also on the cruise of H.M.S. 'Challenger.'

16 in.	by	10	when folded,	15*s.*	per ream,	1*s.* 1*d.*	per quire.
18	,,	11	,,	19*s.*	,,	1*s.* 4*d.*	,,
20	,,	12	,,	23*s.*	,,	1*s.* 9*d.*	,,
20	,,	16	,,	30*s.*	,,	2*s.* 2*d.*	,,

☞ This Paper is too heavy to send by Post.

WEST, NEWMAN & CO., 54, HATTON GARDEN, LONDON.

As some who are not subscribers to this Journal may like to possess the biography of Mr. Newbould which appears in this number, a few copies have been reprinted, with portrait, which may be obtained from the Editor, 18, West Square, Southwark, S.E.; price 1*s*., post-free.

Just Published, Free by Post for Three Stamps.

NATURAL HISTORY AND SCIENTIFIC BOOK CIRCULAR. No. 71. — Containing Valuable Works on BOTANY (General, Fossil, and Cryptogamic Botany). Local and Foreign Floras, Medical and Economic Botany, Trees and Forestry.

WILLIAM WESLEY & SON, 28, Essex Street, Strand, London, W.C.

On the 1st of each Month, price Sixpence,

THE ENTOMOLOGIST:

AN ILLUSTRATED JOURNAL OF GENERAL ENTOMOLOGY.

Edited by JOHN T. CARRINGTON, F.L.S., with the assistance of FREDERICK BOND, F.Z.S., F.E.S., EDWARD A. FITCH, F.L.S., F.E.S., JOHN A. POWER, M.D., RICHARD SOUTH, F.E.S., J. JENNER WEIR, F.L.S., F.Z.S., V.-P.E.S., F. BUCHANAN WHITE, M.D., F.L.S., F.E.S.

SIMPKIN, MARSHALL & Co., Stationers' Hall Court.

ESTABLISHED 1851.

BIRKBECK BANK.—Southampton Buildings, Chancery Lane. THREE per CENT. INTEREST allowed on DEPOSITS, repayable on demand.

TWO per CENT. INTEREST allowed on CURRENT ACCOUNTS, calculated on the minimum monthly balances, when not drawn below £100.

The Bank undertakes for its Customers, free of charge, the custody of Deeds, Writings, and other Securities and Valuables; the collection of Bills of Exchange, Dividends, and Coupons; and the purchase and sale of Stocks, Shares, and Annuities.

The BIRKBECK ALMANACK, with full particulars, can be obtained post free, on application to

FRANCIS RAVENSCROFT, Manager.

March 31*st*, 1884.

The Birkbeck Building Society's Annual Receipts exceed Five Millions.

HOW TO PURCHASE A HOUSE FOR TWO GUINEAS PER MONTH, with immediate Possession and no Rent to pay. Apply at the Office of the BIRKBECK BUILDING SOCIETY.

HOW TO PURCHASE A PLOT OF LAND FOR FIVE SHILLINGS PER MONTH, with immediate possession, either for Building or Gardening purposes. Apply at the Office of the BIRKBECK FREEHOLD LAND SOCIETY. A Pamphlet, with full particulars, on application.

FRANCIS RAVENSCROFT, Manager.

Southampton Buildings, Chancery Lane.

LONDON: WEST NEWMAN AND CO., 54, HATTON GARDEN, E.C.

Annual Subscription, paid in advance, Twelve Shillings, post free within the Postal Union. Single Numbers, 1s. 3d.

No. 283. JULY, 1886. Vol. XXIV.

THE

JOURNAL OF BOTANY

BRITISH AND FOREIGN.

EDITED BY

JAMES BRITTEN, F.L.S.,

British Museum (Natural History), South Kensington.

CONTENTS.

PAGE

Notes on Japanese Desmids.—No. I. By John Roy & J. P. Bisset. (Plate 268) 193

New or Noteworthy Fungi; Part III. By W. B. Grove, B.Sc. (Concluded) 197

Notes on Somerset Rubi. By the Rev. R. P. Murray, M.A., F.L.S. 206

Notes on the Flora of St. Kilda. By R. M. Barrington, M.A., F.L.S. 213

Notes on British Rubi: with special reference to the list in 'London Catalogue,' ed. 8. By C. C. Babington, M.A., F.R.S. 216

Short Notes.—*Potamogeton coriaceus* Nolte. — *Scirpus rufus* Wahlb. in E. Suffolk 223

Notices of Books:—

Short Notices 223

New Books 224

Articles in Journals 224

LONDON:

WEST, NEWMAN & CO., 54, HATTON GARDEN, E.C.

DULAU & CO., SOHO SQUARE.

Price One Shilling and Threepence.

NOTICE.

The JOURNAL OF BOTANY is printed and published by WEST, NEWMAN & Co., 54, Hatton Garden, London, E.C., to whom Subscriptions for 1886 (in advance, Twelve Shillings; if not paid in advance, chargeable at the rate of 1s. 3d. per number) should be paid. Post-Office Orders may be drawn on the Hatton Garden Office.

The Volume for 1885 (price 16s. 6d., bound in cloth) is now on sale; also covers for the Volume (price 1s. 2d. post free).

The Volumes for 1883 and 1884 can still be had.

For Volumes and back numbers for 1872—82 application should be made to DULAU & Co., Soho Square, W.

The Editor will be glad to send the JOURNAL OF BOTANY in exchange for other Journals of a similar character. Such Journals, books for review, and communications intended for publication, to be addressed to JAMES BRITTEN, Esq., 18, West Square, Southwark, S.E.

He will be greatly obliged to the Secretaries of Local Natural History Societies if they will forward him copies of their Transactions, so that any paper of botanical interest may be recorded in this Journal.

TERMS FOR ADVERTISEMENTS.

Whole page	£2	0	0	Quarter page	0	15	0
Half page	1	5	0	Six lines and under	0	5	0

Every additional line, 9d.

A liberal reduction is made for a series.

To be sent to WEST, NEWMAN & Co., 54, Hatton Garden, not later than the 24th of each month.

AUTHOR'S SEPARATE COPIES.

Authors who require copies of their articles are requested to order separate copies from the Publishers, and to notify this and state the number required at head of their MS.; otherwise the type may be distributed before the order is received. By the buying of additional copies of the Journal sets are destroyed. The charges for separate copies are as under :—

2 pages	25	copies	4s.	4 pages	25	copies	5s.	8 pages	25	copies	8s. 0d.
,,	50	,,	5s.	,,	50	,,	6s.	,,	50	,,	9s. 0d.
,,	100	,,	7s.	,,	100	,,	8s.	,,	100	,,	10s. 6d.

A greater number of pages to be charged in equal proportion. Separate Titles, Wrappers, &c., extra.

Annual Subscription, paid in advance, Twelve Shillings, post free within the Postal Union. Single Numbers, 1s. 3d.

No. 284. AUGUST, 1886. Vol. XXIV.

THE JOURNAL OF BOTANY

BRITISH AND FOREIGN.

EDITED BY

JAMES BRITTEN, F.L.S.,

British Museum (Natural History), South Kensington.

CONTENTS.

	PAGE
Notes on British Rubi: with special reference to the list in 'London Catalogue,' ed. 8. By C. C. Babington, M.A., F.R.S. (Concluded)	225
Notes on Japanese Desmids.—No. I. By John Roy & J. P. Bisset. (Plate 268). (Concluded) ..	237
A new Tree Fern from Central America. By J. G. Baker, F.R.S.	243
A new *Echinca*. By J. G. Baker, F.R.S.	243
Short Note. — Botanical Nomenclature	244
Additions to the Botanical Department of the British Museum during 1885. By W. Carruthers, F.R.S.	244
Notices of Books:—	
Sylloge Fungorum omnium hucusque cognitorum. Vol. IV.—Hyphomycetes. Prof. P. A. Saccardo	247
The Flora of Oxfordshire. By George Claridge Druce ..	249
Illustrations of British Fungi (Hymenomycetes). By M. C. Cooke, M.A., LL.D., A.L.S. ..	252
Short Notices	254
New Books	254
Articles in Journals	254

LONDON:

WEST, NEWMAN & CO., 54, HATTON GARDEN, E.C.

DULAU & CO., SOHO SQUARE.

Price One Shilling and Threepence.

NOTICE.

The JOURNAL OF BOTANY is printed and published by WEST, NEWMAN & Co., 54, Hatton Garden, London, E.C., to whom Subscriptions for 1886 (in advance, Twelve Shillings; if not paid in advance, chargeable at the rate of 1s. 3d. per number) should be paid. Post-Office Orders may be drawn on the Hatton Garden Office.

The Volume for 1885 (price 16s. 6d., bound in cloth) is now on sale; also covers for the Volume (price 1s. 2d. post free).

The Volumes for 1883 and 1884 can still be had.

For Volumes and back numbers for 1872—82 application should be made to DULAU & Co., Soho Square, W.

The Editor will be glad to send the JOURNAL OF BOTANY in exchange for other Journals of a similar character. Such Journals, books for review, and communications intended for publication, to be addressed to JAMES BRITTEN, Esq., 18, West Square, Southwark, S.E.

He will be greatly obliged to the Secretaries of Local Natural History Societies if they will forward him copies of their Transactions, so that any paper of botanical interest may be recorded in this Journal.

TERMS FOR ADVERTISEMENTS.

Whole page	£2	0	0	Quarter page	0	15	0
Half page	1	5	0	Six lines and under	0	5	0

Every additional line, 9d.

A liberal reduction is made for a series.

To be sent to WEST, NEWMAN & Co., 54, Hatton Garden, not later than the 24th of each month.

AUTHOR'S SEPARATE COPIES.

Authors who require copies of their articles are requested to order separate copies from the Publishers, and to notify this and state the number required at head of their MS.; otherwise the type may be distributed before the order is received. By the buying of additional copies of the Journal sets are destroyed. The charges for separate copies are as under :—

2 pages	25	copies	4s.	4 pages	25	copies	5s.	8 pages	25	copies	8s. 0d.
,,	50	,,	5s.	,,	50	,,	6s.	,,	50	,,	9s. 0d.
,,	100	,,	7s.	,,	100	,,	8s.	,,	100	,,	10s. 6d.

A greater number of pages to be charged in equal proportion. Separate Titles, Wrappers, &c., extra.

Annual Subscription, paid in advance, Twelve Shillings, post free within the Postal Union. Single Numbers, 1s. 3d.

No. 285. SEPTEMBER, 1886. Vol. XXIV.

THE JOURNAL OF BOTANY

BRITISH AND FOREIGN.

EDITED BY

JAMES BRITTEN, F.L.S.,

British Museum (Natural History), South Kensington.

CONTENTS.

PAGE

On the structure and functions of the subterranean parts of *Lathræa squamaria* L. By George Massee, F.R.M.S. (Plate 269). 257

The Mosses of Ross-shire. By H. N. Dixon, M.A., F.L.S. 263

Some additional Jamaica Ferns. By G. S. Jenman, F.L.S. 265

A Synopsis of the *Rhizocarpeæ*. By J. G. Baker, F.R.S., F.L.S. (Continued) 274

Short Notes. — Suffolk Mosses. — Abnormal Wound-wort. — Peloria in *Ophrys apifera* Huds. — *Elymus arenarius* in South Wilts. — *Polypodium calcareum* Sm. in Northamptonshire. — *Lycopodium clavatum* L. in Northamptonshire. — *Habenaria albida* in Brecon. — Rate of increase of Fairy Rings 283

Notices of Books:—

Catalogue of the Palæozoic Plants in the Department of Geology and Palæontology, British Museum (Natural History). By Robert Kidston, F.G.S. .. 285

Short Notice 287

New Books 287

Articles in Journals 288

LONDON:

WEST, NEWMAN & CO., 54, HATTON GARDEN, E.C.

DULAU & CO., SOHO SQUARE.

Price One Shilling and Threepence.

NOTICE.

The JOURNAL OF BOTANY is printed and published by WEST, NEWMAN & Co., 54, Hatton Garden, London, E.C., to whom Subscriptions for 1886 (in advance, Twelve Shillings; if not paid in advance, chargeable at the rate of 1s. 3d. per number) should be paid. Post-Office Orders may be drawn on the Hatton Garden Office.

The Volume for 1885 (price 16s. 6d., bound in cloth) is now on sale; also covers for the Volume (price 1s. 2d. post free).

The Volumes for 1883 and 1884 can still be had.

For Volumes and back numbers for 1872—82 application should be made to DULAU & Co., Soho Square, W.

The Editor will be glad to send the JOURNAL OF BOTANY in exchange for other Journals of a similar character. Such Journals, books for review, and communications intended for publication, to be addressed to JAMES BRITTEN, Esq., 18, West Square, Southwark, S.E.

He will be greatly obliged to the Secretaries of Local Natural History Societies if they will forward him copies of their Transactions, so that any paper of botanical interest may be recorded in this Journal.

TERMS FOR ADVERTISEMENTS.

Whole page	£2	0	0	Quarter page	0	15	0
Half page	1	5	0	Six lines and under	0	5	0

Every additional line, 9d.

A liberal reduction is made for a series.

To be sent to WEST, NEWMAN & Co., 54, Hatton Garden, not later than the 24th of each month.

AUTHOR'S SEPARATE COPIES.

Authors who require copies of their articles are requested to order separate copies from the Publishers, and to notify this and state the number required at head of their MS.; otherwise the type may be distributed before the order is received. By the buying of additional copies of the Journal sets are destroyed. The charges for separate copies are as under :—

2 pages	25	copies	4s.	4 pages	25	copies	5s.	8 pages	25	copies	8s. 0d.
,,	50	,,	5s.	,,	50	,,	6s.	,,	50	,,	9s. 0d.
,,	100	,,	7s.	,,	100	,,	8s.	,,	100	,,	10s. 6d.

A greater number of pages to be charged in equal proportion. Separate Titles, Wrappers, &c., extra.

Annual Subscription, paid in advance, Twelve Shillings, post free within the Postal Union. Single Numbers, 1s. 3d.

No. 287. NOVEMBER, 1886. Vol. XXIV.

THE JOURNAL OF BOTANY

BRITISH AND FOREIGN.

EDITED BY

JAMES BRITTEN, F.L.S.,

British Museum (Natural History), South Kensington.

CONTENTS.

PAGE

On the Monocotyledonous Plants of New Guinea collected by Mr. H. O. Forbes. By H. N. Ridley, M.A., F.L.S. (Plates 270 & 271) 321

On the Flora of Ceylon, especially as affected by Climate. By Hr. Trimen, M.B., F.L.S. (Concluded) 327

New Cape *Liliaceæ*. By J. G. Baker, F.R.S. 335

Notes on Pondweeds. By Alfred Fryer 337

Notes on some North Wales Plants. By Rev. W. Moyle Rogers, F.L.S. 338

Short Notes.—Caithness and West Sutherland Plants. — *Thesium linophyllum* and its host plants. — Hampshire Plants. — *Epilobium angustifolium* L. in Cambridgeshire.—*Rubus leucocarpus* in West Gloucestershire.—East Gloucester "New Records."—New Surrey Plants.—*Callitriche truncata* Guss. in West Kent.—*Pinguicula vulgaris* in South Beds. — *Carex Carri* in South Beds. 343

PAGE

Notices of Books:—

Revision de Plantas Vasculares Filipinas, Memoria elevada al Excmo. Sr. Ministro de Ultramar. Por D. Sebastian Vidal y Soler 347

Recent Books on Bacteriology .. 350

Short Notice 351

New Books 351

Articles in Journals 352

LONDON:

WEST, NEWMAN & CO., 54, HATTON GARDEN, E.C.

DULAU & CO., SOHO SQUARE.

Price One Shilling and Threepence.

NOTICE.

The JOURNAL OF BOTANY is printed and published by WEST, NEWMAN & Co., 54, Hatton Garden, London, E.C., to whom Subscriptions for 1886 (in advance, Twelve Shillings; if not paid in advance, chargeable at the rate of 1s. 3d. per number) should be paid. Post-Office Orders may be drawn on the Hatton Garden Office.

The Volume for 1885 (price 16s. 6d., bound in cloth) is now on sale; also covers for the Volume (price 1s. 2d. post free).

The Volumes for 1883 and 1884 can still be had.

For Volumes and back numbers for 1872—82 application should be made to DULAU & Co., Soho Square, W.

The Editor will be glad to send the JOURNAL OF BOTANY in exchange for other Journals of a similar character. Such Journals, books for review, and communications intended for publication, to be addressed to JAMES BRITTEN, Esq., 18, West Square, Southwark, S.E.

He will be greatly obliged to the Secretaries of Local Natural History Societies if they will forward him copies of their Transactions, so that any paper of botanical interest may be recorded in this Journal.

TERMS FOR ADVERTISEMENTS.

Whole page	£2	0	0	Quarter page	0	15	0
Half page	1	5	0	Six lines and under	0	5	0

Every additional line, 9d.

A liberal reduction is made for a series.

To be sent to WEST, NEWMAN & Co., 54, Hatton Garden, not later than the 24th of each month.

AUTHOR'S SEPARATE COPIES.

Authors who require copies of their articles are requested to order separate copies from the Publishers, and to notify this and state the number required at head of their MS.; otherwise the type may be distributed before the order is received. By the buying of additional copies of the Journal sets are destroyed. The charges for separate copies are as under:—

2 pages	25 copies	4s.		4 pages	25 copies	5s.		8 pages	25 copies	7s. 0d.
"	50 "	5s.		"	50 "	6s.		"	50 "	9s. 0d.
"	100 "	7s.		"	100 "	8s.		"	100 "	10s. 6d.

A greater number of pages to be charged in equal proportion. Separate Titles, Wrappers, &c., extra.

☞ SUBSCRIPTIONS (12s., post free within the Postal Union) HAVE EXPIRED.

No. 288. DECEMBER, 1886. Vol. XXIV.

THE JOURNAL OF BOTANY

BRITISH AND FOREIGN.

EDITED BY

JAMES BRITTEN, F.L.S.,

British Museum (Natural History), South Kensington.

CONTENTS.

	PAGE
On the Monocotyledonous Plants of New Guinea collected by Mr. H. O. Forbes. By H. N. Ridley, M.A., F.L.S. (Plates 270 & 271) (Concluded)	353
Localities for Irish Hepatics and Mosses. By Hy. Chichester Hart	360
The Distribution of *Potamogeton* in Britain. By Arthur Bennett, F.L.S.	362
Notes on some North Wales Plants. By Rev. W. Moyle Rogers, F.L.S. (Concluded)	363
New Records for Gloucester and Monmouth. By the Rev. H. P. Reader, M.A.	368
Notes on the Flora of Northamptonshire. By G. Claridge Druce, F.L.S.	370
New Records. By the Rev. W. R. Linton	376
On *Sparganium neglectum*. By W. H. Beeby	377
Notes on Pondweeds. By Alfred Fryer	378
A Synopsis of the *Rhizocarpeæ*. By J. G. Baker, F.R.S., F.L.S. (Concluded)	381
Notices of Books:—	
New Books	382
Articles in Journals	382
Linnean Society of London	384
Obituary	384

TITLE and INDEX for Vol. XXIV.

LONDON:

WEST, NEWMAN & CO., 54, HATTON GARDEN, E.C.

DULAU & CO., SOHO SQUARE.

Price One Shilling and Threepence.

Just Published, Free by Post for Three Stamps.

NATURAL HISTORY AND SCIENTIFIC BOOK CIRCULAR. No. 76. — BOTANY: *Containing the Library of the late Rev. W. W. Newbould, F.L.S.*: and other Recent Purchases, including Valuable and Scarce Works on the Geography of Plants, Flora of Europe, Local Floras of England, Wales, Scotland and Ireland, Flora of Asia, Australasia, Africa, America, and West Indies, Pre-Linnean Botany, General Botany, Phanerogams, Botanical Gardens.

William Wesley & Son, 28, Essex Street, Strand, London, W.C.

On the 1st of every Month, price One Shilling,

THE ZOOLOGIST:

A MONTHLY MAGAZINE OF NATURAL HISTORY.

Third Series, Edited by J. E. HARTING, F.L.S., F.Z.S.

Original Articles by well-known Naturalists in every branch of Zoology; Habits of Animals; Arrival and Departure of Migratory Birds; Occurrence of Rare Birds; British Fresh-water Fishes: New or Rare Marine Fishes: Local Aquaria; British Reptiles: British Land and Fresh-water Mollusca, with remarks on the habits and haunts of the species: and other matters of general interest to those who delight in Natural History. Reports of the Linnean, Zoological and Entomological Societies: Reviews of Natural-History books, &c

JOHN VAN VOORST, 1, Paternoster Row.

On the 1st of each Month, price Sixpence,

THE ENTOMOLOGIST:

AN ILLUSTRATED JOURNAL OF GENERAL ENTOMOLOGY.

Edited by John T. Carrington, F.L.S., with the assistance of Frederick Bond, F.Z.S., F.E.S., Edward A. Fitch, F.L.S., F.E.S., Richard South, F.E.S., J. Jenner Weir, F.L.S., F.Z.S., V.-P.E.S., F. Buchanan White, M.D., F.L.S., F.E.S.

Simpkin, Marshall & Co., Stationers' Hall Court.

ESTABLISHED 1851.

BIRKBECK BANK.—Southampton Buildings, Chancery Lane.

THREE per CENT. INTEREST allowed on DEPOSITS, repayable on demand.

TWO per CENT. INTEREST allowed on CURRENT ACCOUNTS, calculated on the minimum monthly balances, when not drawn below £100.

The Bank undertakes for its Customers, free of charge, the custody of Deeds, Writings, and other Securities and Valuables; the collection of Bills of Exchange, Dividends, and Coupons; and the purchase and sale of Stocks, Shares, and Annuities.

The BIRKBECK ALMANACK, with full particulars, can be obtained post free, on application to

March 31st, 1864.

FRANCIS RAVENSCROFT, Manager.

The Birkbeck Building Society's Annual Receipts exceed Five Millions.

HOW to PURCHASE a HOUSE for TWO GUINEAS per MONTH, with immediate Possession and no Rent to pay. Apply at the Office of the Birkbeck Building Society.

HOW to PURCHASE a PLOT of LAND for FIVE SHILLINGS per MONTH, with immediate possession, either for Building or Gardening purposes. Apply at the Office of the Birkbeck Freehold Land Society. A Pamphlet, with full particulars, on application.

Southampton Buildings, Chancery Lane.

FRANCIS RAVENSCROFT, Manager.

THE GARDEN:

A WEEKLY ILLUSTRATED JOURNAL OF HORTICULTURE IN ALL ITS BRANCHES.

Price Fourpence.

"Mr. Robinson's valuable and elegant weekly."—*The Saturday Review.*

The following are some of the subjects regularly discussed in THE GARDEN:—Hardy Flowers, the Conservatory, Town Gardens, the Wild Garden, the Greenhouse and Stove, Public Gardens, the Kitchen Garden, the Household, the Flower Garden, Landscape Gardening, the Fruit Garden, Garden Structures, Room and Window Gardens, Notes and Questions, Market Gardening, Trees and Shrubs, Garden Implements, and Appliances of all kinds.

Terms of Subscription.—Sent direct from the Office in London, post-free, payable in advance—For One Year, 19s. 6d.: Half a Year, 9s. 9d.: Quarter of a Year, 5s.

37, SOUTHAMPTON STREET, COVENT GARDEN, W.C.

THE BOTANICAL MAGAZINE.

THIRD SERIES.

Coloured Figures and Descriptions of New and Rare Plants of interest to the Botanical Student, and available for the Garden, Stove, or Greenhouse. By Sir J. D. HOOKER, C.B., F.R.S., F.L.S., &c.

Monthly, with six Coloured Plates, 3s. 6d. Annual Subscription, 42s.

L. REEVE & CO., 5, HENRIETTA STREET, COVENT GARDEN.

NATURE:

A WEEKLY ILLUSTRATED JOURNAL OF SCIENCE.

One of the leading objects of this periodical is to awaken in the public mind a more lively interest in Science. With this end in view it provides original Articles and Reviews, written by scientific men of the highest distinction in their various departments, expounding in a popular and yet authentic manner the grand results of scientific research, discussing the most recent scientific discoveries, and pointing out the bearing of Science upon Civilization and progress, and its claims to more general recognition, as well as to a higher place in the educational system of the country.

Published every Thursday, price 6d. Yearly Subscription, 26s.: Half-yearly, 14s. 6d.: Quarterly, 7s. 6d. Post-Office Orders to be made payable at King Street, Covent Garden, W.C.

MACMILLAN & CO., Bedford Street, Strand, W.C.

BOTANICAL DRYING PAPER

FOR DRYING FLOWERING PLANTS, FERNS, AND SEA-WEEDS.

Preserves form and colour in the best possible manner. Used by the Naturalists on board the Arctic ships, and also on the cruise of H.M.S. 'Challenger.'

16 in.	by	10	when folded,	15s.	per ream,	1s. 1d.	per quire.
18	,,	11	,,	19s.	,,	1s. 4d.	,,
20	,,	12	,,	23s.	,,	1s. 9d.	,,
20	,,	16	,,	30s.	,,	2s. 2d.	,,

☞ This Paper is too heavy to send by Post.

WEST, NEWMAN & CO., 54, HATTON GARDEN, LONDON.

NOTICE.

The JOURNAL OF BOTANY is printed and published by WEST, NEWMAN & Co., 54, Hatton Garden, London, E.C., to whom Subscriptions for 1887 (in advance, Twelve Shillings; if not paid in advance, chargeable at the rate of 1s. 3d. per number) should be paid. Post-Office Orders may be drawn on the Hatton Garden Office.

The Volume for 1886 (price 16s. 6d., bound in cloth) will shortly be ready: also covers for the Volume (price 1s. 2d. post free).

The Volumes for 1883, 1884, and 1885 can still be had.

For Volumes and back numbers for 1872—82 application should be made to DULAU & Co., Soho Square, W.

The Editor will be glad to send the JOURNAL OF BOTANY in exchange for other Journals of a similar character. Such Journals, books for review, and communications intended for publication, to be addressed to JAMES BRITTEN, Esq., 18, West Square, Southwark, S.E.

He will be greatly obliged to the Secretaries of Local Natural History Societies if they will forward him copies of their Transactions, so that any paper of botanical interest may be recorded in this Journal.

TERMS FOR ADVERTISEMENTS.

Whole page	£2	0	0	Quarter page	0	15	0
Half page	1	5	0	Six lines and under	0	5	0

Every additional line, 9d.

A liberal reduction is made for a series

To be sent to WEST, NEWMAN & Co., 54, Hatton Garden, not later than the 24th of each month.

AUTHOR'S SEPARATE COPIES.

Authors who require copies of their articles are requested to order separate copies from the Publishers, and to notify this and state the number required at head of their MS.; otherwise the type may be distributed before the order is received. By the buying of additional copies of the Journal sets are destroyed. The charges for separate copies are as under:—

2 pages	25 copies	4s.	4 pages	25 copies	5s.	8 pages	25 copies	8s. 0d.
,,	50 ,,	5s.	,,	50 ,,	6s.	,,	50 ,,	9s. 0d.
,,	100 ,,	7s.	,,	100 ,,	8s.	,,	100 ,,	10s. 6d.

A greater number of pages to be charged in equal proportion. Separate Titles, Wrappers, &c., extra.

LONDON: WEST, NEWMAN AND CO., 54, HATTON GARDEN, E.C.

BOTANICAL DRYING PAPER

FOR DRYING FLOWERING PLANTS, FERNS, AND SEA-WEEDS.

Preserves form and colour in the best possible manner. Used by the Naturalists on board the Arctic ships, and also on the cruise of H.M.S. 'Challenger.'

16 in.	by	10	when folded,	15s.	per ream,	1s. 1d.	per quire.
18	,,	11	,,	19s.	,,	1s. 4d.	,,
20	,,	12	,,	23s.	,,	1s. 9d.	,,
20	,,	16	,,	30s.	,,	2s. 2d.	,,

☞ This Paper is too heavy to send by Post.

WEST, NEWMAN & CO., 54, HATTON GARDEN, LONDON.

THE BOTANICAL MAGAZINE.

THIRD SERIES.

Coloured Figures and Descriptions of New and Rare Plants of interest to the Botanical Student, and available for the Garden, Stove, or Greenhouse. By Sir J. D. Hooker, C.B., F.R.S., F.L.S., &c.

Monthly, with six Coloured Plates, 3s. 6d. *Annual Subscription*, 42s.

L. REEVE & CO., 5, HENRIETTA STREET, COVENT GARDEN.

THE GARDEN:

A Weekly Illustrated Journal of Horticulture in all its Branches.

Price Fourpence.

"Mr. Robinson's valuable and elegant weekly."—*The Saturday Review.*

The following are some of the subjects regularly discussed in The Garden:—Hardy Flowers, the Conservatory, Town Gardens, the Wild Garden, the Greenhouse and Stove, Public Gardens, the Kitchen Garden, the Household, the Flower Garden, Landscape Gardening, the Fruit Garden, Garden Structures, Room and Window Gardens, Notes and Questions, Market Gardening, Trees and Shrubs, Garden Implements, and Appliances of all kinds.

Terms of Subscription.—Sent direct from the Office in London, post-free, payable in advance—For One Year, 19s. 6d.; Half a Year, 9s. 9d.; Quarter of a Year, 5s.

37, SOUTHAMPTON STREET, COVENT GARDEN, W.C.

NATURE:

A WEEKLY ILLUSTRATED JOURNAL OF SCIENCE.

One of the leading objects of this periodical is to awaken in the public mind a more lively interest in Science. With this end in view it provides original Articles and Reviews, written by scientific men of the highest distinction in their various departments, expounding in a popular and yet authentic manner the grand results of scientific research, discussing the most recent scientific discoveries, and pointing out the bearing of Science upon Civilization and progress, and its claims to more general recognition, as well as to a higher place in the educational system of the country.

Published every Thursday, price 6d. Yearly Subscription, 28s.; Half-yearly, 14s. 6d.; Quarterly, 7s. 6d. Post-Office Orders to be made payable at King Street, Covent Garden, W.C.

MACMILLAN & CO., Bedford Street, Strand, W.C.

Just Published, Free by Post for Three Stamps.

NATURAL HISTORY AND SCIENTIFIC BOOK CIRCULAR. No. 76. — BOTANY: *Containing the Library of the late Rev. W. W. Newbould, F.L.S.*; and other Recent Purchases, including Valuable and Scarce Works on the Geography of Plants, Flora of Europe, Local Floras of England, Wales, Scotland and Ireland, Flora of Asia, Australasia, Africa, America, and West Indies, Pre-Linnean Botany, General Botany, Phanerogams, Botanical Gardens.

William Wesley & Son, 28, Essex Street, Strand, London, W.C.

On the 1st of every Month, price One Shilling,

THE ZOOLOGIST:

A MONTHLY MAGAZINE OF NATURAL HISTORY.

Third Series, Edited by J. E. HARTING, F.L.S., F.Z.S.

Original Articles by well-known Naturalists in every branch of Zoology; Habits of Animals; Arrival and Departure of Migratory Birds; Occurrence of Rare Birds; British Fresh-water Fishes; New or Rare Marine Fishes; Local Aquaria; British Reptiles; British Land and Fresh-water Mollusca, with remarks on the habits and haunts of the species; and other matters of general interest to those who delight in Natural History. Reports of the Linnean, Zoological and Entomological Societies; Reviews of Natural-History books, &c.

JOHN VAN VOORST, 1, Paternoster Row.

On the 1st of each Month, price Sixpence,

THE ENTOMOLOGIST:

AN ILLUSTRATED JOURNAL OF GENERAL ENTOMOLOGY.

Edited by John T. Carrington, F.L.S., with the assistance of Frederick Bond, F.Z.S., F.E.S., Edward A. Fitch, F.L.S., F.E.S., Richard South, F.E.S., J. Jenner Weir, F.L.S., F.Z.S., V.-P.E.S., F. Buchanan White, M.D., F.L.S., F.E.S.

Simpkin, Marshall & Co., Stationers' Hall Court.

ESTABLISHED 1851.

BIRKBECK BANK.—Southampton Buildings, Chancery Lane.

THREE per CENT. INTEREST allowed on DEPOSITS, repayable on demand.

TWO per CENT. INTEREST allowed on CURRENT ACCOUNTS, calculated on the minimum monthly balances, when not drawn below £100.

The Bank undertakes for its Customers, free of charge, the custody of Deeds, Writings, and other Securities and Valuables; the collection of Bills of Exchange, Dividends, and Coupons; and the purchase and sale of Stocks, Shares, and Annuities.

The BIRKBECK ALMANACK, with full particulars, can be obtained post free, on application to

FRANCIS RAVENSCROFT, Manager.

March 31st, 1884.

The Birkbeck Building Society's Annual Receipts exceed Five Millions.

HOW TO PURCHASE A HOUSE FOR TWO GUINEAS PER MONTH, with immediate Possession and no Rent to pay. Apply at the Office of the Birkbeck Building Society.

HOW TO PURCHASE A PLOT OF LAND FOR FIVE SHILLINGS PER MONTH, with immediate possession, either for Building or Gardening purposes. Apply at the Office of the Birkbeck Freehold Land Society. A Pamphlet, with full particulars, on application.

FRANCIS RAVENSCROFT, Manager.

Southampton Buildings, Chancery Lane.

LONDON: WEST, NEWMAN AND CO., 54, HATTON GARDEN, E.C.

Annual Subscription, paid in advance, Twelve Shillings, post free within the Postal Union. Single Numbers, 1s. 3d.

No. 286. OCTOBER, 1886. Vol. XXIV.

THE JOURNAL OF BOTANY BRITISH AND FOREIGN.

EDITED BY

JAMES BRITTEN, F.L.S.,

British Museum (Natural History), South Kensington.

CONTENTS.

PAGE

New Vacciniaceæ from New Guinea. By Baron F. von Mueller, K.C.M.G., M.D., F.R.S., &c. .. 289

Notes on the Orchids of Tropical Africa. By H. N. Ridley, M.A., F.L.S. 291

On the Nomenclature of some *Proteaceæ*. By James Britten. F.L.S. 296

Supplementum Enumerationi *Dianthi*. Auctore F. N. Williams. 301

On the Flora of Ceylon, especially as affected by Climate. By Hy. Trimen, M.B., F.L.S. 301

A new *Amorphophallus* from Gambia. By H. N. Ridley, M.A., F.L.S. 305

PAGE

Short Notes. — *Potamogeton fluitans* Roth. in Cambridgeshire. — *Elymus arenarius* in North Somerset. — Flora of Colonsay and Oransay. — *Rubus pallidus* W. & N. in Britain. — *Senecio squalidus* L. in South Somerset 307

The Age of some existing species of Plants: being the Address to the Biological Section of the British Association at Birmingham, 1886. By Wm. Carruthers, Pres. L.S., F.R.S., President of the Section 309

Notices of Books:—

Short Notice 319

New Books 319

Articles in Journals 319

LONDON:

WEST, NEWMAN & CO., 54, HATTON GARDEN, E.C.

DULAU & CO., SOHO SQUARE.

Price One Shilling and Threepence.

NOTICE.

The JOURNAL OF BOTANY is printed and published by WEST, NEWMAN & Co., 54, Hatton Garden, London, E.C., to whom Subscriptions for 1886 (in advance, Twelve Shillings; if not paid in advance, chargeable at the rate of 1s. 3d. per number) should be paid. Post-Office Orders may be drawn on the Hatton Garden Office.

The Volume for 1885 (price 16s. 6d., bound in cloth) is now on sale; also covers for the Volume (price 1s. 2d. post free).

The Volumes for 1883 and 1884 can still be had.

For Volumes and back numbers for 1872—82 application should be made to DULAU & Co., Soho Square, W.

The Editor will be glad to send the JOURNAL OF BOTANY in exchange for other Journals of a similar character. Such Journals, books for review, and communications intended for publication, to be addressed to JAMES BRITTEN, Esq., 18, West Square, Southwark, S.E.

He will be greatly obliged to the Secretaries of Local Natural History Societies if they will forward him copies of their Transactions, so that any paper of botanical interest may be recorded in this Journal.

TERMS FOR ADVERTISEMENTS.

Whole page	£2	0	0	Quarter page	0	15	0
Half page	1	5	0	Six lines and under	0	5	0

Every additional line, 9d.

A liberal reduction is made for a series.

To be sent to WEST, NEWMAN & Co., 54, Hatton Garden, not later than the 24th of each month.

AUTHOR'S SEPARATE COPIES.

Authors who require copies of their articles are requested to order separate copies from the Publishers, and to notify this and state the number required at head of their MS.; otherwise the type may be distributed before the order is received. By the buying of additional copies of the Journal sets are destroyed. The charges for separate copies are as under :—

2 pages	25 copies	4s.	4 pages	25 copies	5s.	8 pages	25 copies	8s. 0d.
„	50 „	5s.	„	50 „	6s.	„	50 „	9s. 0d.
„	100 „	7s.	„	100 „	8s.	„	100 „	10s. 6d.

A greater number of pages to be charged in equal proportion. Separate Titles, Wrappers, &c., extra.

BOTANICAL DRYING PAPER

FOR DRYING FLOWERING PLANTS, FERNS, AND SEA-WEEDS.

Preserves form and colour in the best possible manner. Used by the Naturalists on board the Arctic ships, and also on the cruise of **H.M.S. 'Challenger.'**

16 in.	by	10	when folded,	15s.	per ream.	1s. 1d.	per quire.
18	,,	11	,,	19s.	,,	1s. 4d.	,,
20	,,	12	,,	23s.	,,	1s. 9d.	,,
20	,,	16	,,	30s.	,,	2s. 2d.	,,

☞ This Paper is too heavy to send by Post.

WEST, NEWMAN & CO., 54. HATTON GARDEN, LONDON.

A New (Eighth) Edition of the

LONDON CATALOGUE OF BRITISH PLANTS

containing numerous alterations and additions, is now ready Price 6*d.*; on stouter paper and bound in limp cloth, 1s.

GENERIC INDEX only, printed on a Card for use as a Guide to the Herbarium, 2*d.*

LONDON: GEORGE BELL & SONS, York Street, Covent Garden, W.C.

THE GARDEN:

A WEEKLY ILLUSTRATED JOURNAL OF HORTICULTURE IN ALL ITS BRANCHES.

Price Fourpence.

"Mr. Robinson's valuable and elegant weekly."—*The Saturday Review.*

The following are some of the subjects regularly discussed in THE GARDEN:—Hardy Flowers, the Conservatory, Town Gardens, the Wild Garden, the Greenhouse and Stove, Public Gardens, the Kitchen Garden, the Household, the Flower Garden, Landscape Gardening, the Fruit Garden, Garden Structures, Room and Window Gardens, Notes and Questions, Market Gardening, Trees and Shrubs, Garden Implements, and Appliances of all kinds.

Terms of Subscription.—Sent direct from the Office in London, post-free, payable in advance—For One Year, 19s. 6d.; Half a Year, 9s. 9d.; Quarter of a Year, 5s.

37, SOUTHAMPTON STREET, COVENT GARDEN, W.C.

NATURE:

A WEEKLY ILLUSTRATED JOURNAL OF SCIENCE.

One of the leading objects of this periodical is to awaken in the public mind a more lively interest in Science. With this end in view it provides original Articles and Reviews, written by scientific men of the highest distinction in their various departments, expounding in a popular and yet authentic manner the grand results of scientific research, discussing the most recent scientific discoveries, and pointing out the bearing of Science upon Civilization and progress, and its claims to more general recognition, as well as to a higher place in the educational system of the country.

Published every Thursday, price 6d. Yearly Subscription, 28s.; Half-yearly, 14s. 6d.; Quarterly, 7s. 6d. Post-Office Orders to be made payable at King Street, Covent Garden, W.C.

MACMILLAN & CO., Bedford Street, Strand, W.C.

Just Published, Free by Post for Three Stamps.

NATURAL HISTORY AND SCIENTIFIC BOOK CIRCULAR. No. 76. — BOTANY: *Containing the Library of the late Rev. W. W. Newbould, F.L.S.*; and other Recent Purchases, including Valuable and Scarce Works on the Geography of Plants, Flora of Europe, Local Floras of England, Wales, Scotland and Ireland, Flora of Asia, Australasia, Africa, America, and West Indies, PRE-LINNEAN BOTANY, General Botany, Phanerogams, Botanical Gardens.

WILLIAM WESLEY & SON, 28, Essex Street, Strand, London, W.C.

TO BE SOLD.

HERBARIUM HEUFLERIANUM.

This Cryptogamic Herbal of the late Baron Lewis Hohenbühel, called Heufler, at Rasen (died in 1885), contains 1431 Genera, 8614 Species, with about 30,400 Specimens, among which there are also several Original Specimens, named after the late owner. This Herbal is likewise meritoriously acknowledged in the 'Third Session Report of the Zoological-Botanical Society at Vienna' (1853, pp. 160—170), in the Eighth Volume of V. Wurzbach's 'Biographical Lexicon of Austria' (1862, p. 454), and in No. 1 of the 'Austrian Botanical Periodical Journal of the year 1868.

Further information to be had of BARON PAUL HOHENBÜHEL, 3, Universitatsstrasse, Innsbruck, Tyrol, Austria-Hungary.

On the 1st of each Month, price Sixpence,

THE ENTOMOLOGIST:

AN ILLUSTRATED JOURNAL OF GENERAL ENTOMOLOGY.

Edited by JOHN T. CARRINGTON, F.L.S., with the assistance of FREDERICK BOND, F.Z.S., F.E.S., EDWARD A. FITCH, F.L.S., F.E.S., RICHARD SOUTH, F.E.S., J. JENNER WEIR, F.L.S., F.Z.S., V.-P.E.S., F. BUCHANAN WHITE, M.D., F.L.S., F.E.S.

SIMPKIN, MARSHALL & Co., Stationers' Hall Court.

ESTABLISHED 1851.

BIRKBECK BANK.—Southampton Buildings, Chancery Lane.

THREE per CENT. INTEREST allowed on DEPOSITS, repayable on demand.

TWO per CENT. INTEREST allowed on CURRENT ACCOUNTS, calculated on the minimum monthly balances, when not drawn below £100.

The Bank undertakes for its Customers, free of charge, the custody of Deeds, Writings, and other Securities and Valuables; the collection of Bills of Exchange, Dividends, and Coupons; and the purchase and sale of Stocks, Shares, and Annuities.

The BIRKBECK ALMANACK, with full particulars, can be obtained post free, on application to

FRANCIS RAVENSCROFT, Manager.

March 31st, 1884.

The Birkbeck Building Society's Annual Receipts exceed Five Millions.

HOW TO PURCHASE A HOUSE FOR TWO GUINEAS PER MONTH, with immediate Possession and no Rent to pay. Apply at the Office of the BIRKBECK BUILDING SOCIETY.

HOW TO PURCHASE A PLOT OF LAND FOR FIVE SHILLINGS PER MONTH, with immediate possession, either for Building or Gardening purposes. Apply at the Office of the BIRKBECK FREEHOLD LAND SOCIETY. A Pamphlet, with full particulars, on application.

FRANCIS RAVENSCROFT, Manager.

Southampton Buildings, Chancery Lane.

LONDON: WEST NEWMAN AND CO., 54, HATTON GARDEN, E.C.

BOTANICAL DRYING PAPER

FOR DRYING FLOWERING PLANTS, FERNS, AND SEA-WEEDS.

Preserves form and colour in the best possible manner. Used by the Naturalists on board the Arctic ships, and also on the cruise of H.M.S. 'Challenger.'

16 in.	by	10	when folded,	15*s.*	per ream,	1*s.* 1*d.*	per quire.
18	,,	11	,,	19*s.*	,,	1*s.* 4*d.*	,,
20	,,	12	,,	23*s.*	,,	1*s.* 9d.	,,
20	,,	16	,,	30*s.*	,,	2*s.* 2*d.*	,,

☞ This Paper is too heavy to send by Post.

WEST, NEWMAN & CO., 54. HATTON GARDEN, LONDON.

A New (Eighth) Edition of the

LONDON CATALOGUE OF BRITISH PLANTS

containing numerous alterations and additions, is now ready Price *6d.*; on stouter paper and bound in limp cloth, 1*s.*

GENERIC INDEX only, printed on a Card for use as a Guide to the Herbarium, 2*d.*

LONDON: GEORGE BELL & SONS, York Street, Covent Garden, W.C.

THE GARDEN:

A WEEKLY ILLUSTRATED JOURNAL OF HORTICULTURE IN ALL ITS BRANCHES.

Price Fourpence.

"Mr. Robinson's valuable and elegant weekly."—*The Saturday Review.*

The following are some of the subjects regularly discussed in THE GARDEN:—Hardy Flowers, the Conservatory, Town Gardens, the Wild Garden, the Greenhouse and Stove, Public Gardens, the Kitchen Garden, the Household, the Flower Garden, Landscape Gardening, the Fruit Garden, Garden Structures, Room and Window Gardens, Notes and Questions, Market Gardening, Trees and Shrubs, Garden Implements, and Appliances of all kinds.

Terms of Subscription.—Sent direct from the Office in London, post-free, payable in advance—For One Year, 19s. 6d.; Half a Year, 9s. 9d.; Quarter of a Year, 5s.

37, SOUTHAMPTON STREET, COVENT GARDEN, W.C.

NATURE:

A WEEKLY ILLUSTRATED JOURNAL OF SCIENCE.

One of the leading objects of this periodical is to awaken in the public mind a more lively interest in Science. With this end in view it provides original Articles and Reviews, written by scientific men of the highest distinction in their various departments, expounding in a popular and yet authentic manner the grand results of scientific research, discussing the most recent scientific discoveries, and pointing out the bearing of Science upon Civilization and progress, and its claims to more general recognition, as well as to a higher place in the educational system of the country.

Published every Thursday, price 6d. Yearly Subscription, 28s.: Half-yearly, 14s. 6d.; Quarterly, 7s. 6d. Post-Office Orders to be made payable at King Street, Covent Garden, W.C.

MACMILLAN & CO., Bedford Street, Strand, W.C.

Just Published, Free by Post for Three Stamps.

NATURAL HISTORY AND SCIENTIFIC BOOK CIRCULAR. No. 76. — BOTANY: *Containing the Library of the late Rev. W. W. Newbould, F.L.S.*; and other Recent Purchases, including Valuable and Scarce Works on the Geography of Plants, Flora of Europe, Local Floras of England, Wales, Scotland and Ireland, Flora of Asia, Australasia, Africa, America, and West Indies. PRE-LINNEAN BOTANY, General Botany, Phanerogams, Botanical Gardens.

WILLIAM WESLEY & SON, 28, Essex Street, Strand, London, W.C.

TO BE SOLD.

HERBARIUM HEUFLERIANUM.

This Cryptogamic Herbal of the late Baron Lewis Hohenbühel, called Heufler, at Rasen (died in 1885), contains 1431 Genera, 8614 Species, with about 30,400 Specimens, among which there are also several Original Specimens, named after the late owner. This Herbal is likewise meritoriously acknowledged in the 'Third Session Report of the Zoological-Botanical Society at Vienna' (1853, pp. 160—170), in the Eighth Volume of V. Wurzbach's 'Biographical Lexicon of Austria' (1862, p. 454), and in No. 1 of the 'Austrian Botanical Periodical Journal of the year 1868.

Further information to be had of BARON PAUL HOHENBÜHEL, 3, Universitatsstrasse, Innsbruck, Tyrol, Austria-Hungary.

On the 1st of each Month, price Sixpence,

THE ENTOMOLOGIST:

AN ILLUSTRATED JOURNAL OF GENERAL ENTOMOLOGY.

Edited by JOHN T. CARRINGTON, F.L.S., with the assistance of FREDERICK BOND, F.Z.S., F.E.S., EDWARD A. FITCH, F.L.S., F.E.S., RICHARD SOUTH, F.E.S., J. JENNER WEIR, F.L.S., F.Z.S., V.-P.E.S., F. BUCHANAN WHITE, M.D., F.L.S., F.E.S.

SIMPKIN, MARSHALL & Co., Stationers' Hall Court.

ESTABLISHED 1851.

BIRKBECK BANK.—Southampton Buildings, Chancery Lane. THREE per CENT. INTEREST allowed on DEPOSITS, repayable on demand.

TWO per CENT. INTEREST allowed on CURRENT ACCOUNTS, calculated on the minimum monthly balances, when not drawn below £100.

The Bank undertakes for its Customers, free of charge, the custody of Deeds, Writings, and other Securities and Valuables; the collection of Bills of Exchange, Dividends, and Coupons; and the purchase and sale of Stocks, Shares, and Annuities.

The BIRKBECK ALMANACK, with full particulars, can be obtained post free, on application to

FRANCIS RAVENSCROFT, Manager.

March 31st, 1884.

The Birkbeck Building Society's Annual Receipts exceed Five Millions.

HOW TO PURCHASE A HOUSE FOR TWO GUINEAS PER MONTH, with immediate Possession and no Rent to pay. Apply at the Office of the BIRKBECK BUILDING SOCIETY.

HOW TO PURCHASE A PLOT OF LAND FOR FIVE SHILLINGS PER MONTH, with immediate possession, either for Building or Gardening purposes. Apply at the Office of the BIRKBECK FREEHOLD LAND SOCIETY. A Pamphlet, with full particulars, on application.

FRANCIS RAVENSCROFT, Manager.

Southampton Buildings, Chancery Lane.

LONDON: WEST NEWMAN AND CO., 54, HATTON GARDEN, E.C.

A New (Eighth) Edition of the

LONDON CATALOGUE OF BRITISH PLANTS

containing numerous alterations and additions, is now ready Price 6*d.*; on stouter paper and bound in limp cloth, 1*s.*

GENERIC INDEX only, printed on a Card for use as a Guide to the Herbarium, 2*d.*

LONDON: GEORGE BELL & SONS, York Street, Covent Garden, W.C.

THE GARDEN:

A WEEKLY ILLUSTRATED JOURNAL OF HORTICULTURE IN ALL ITS BRANCHES.

Price Fourpence.

"Mr. Robinson's valuable and elegant weekly."—*The Saturday Review.*

The following are some of the subjects regularly discussed in THE GARDEN:—Hardy Flowers, the Conservatory, Town Gardens, the Wild Garden, the Greenhouse and Stove, Public Gardens, the Kitchen Garden, the Household, the Flower Garden, Landscape Gardening, the Fruit Garden, Garden Structures, Room and Window Gardens, Notes and Questions, Market Gardening, Trees and Shrubs, Garden Implements, and Appliances of all kinds.

Terms of Subscription.—Sent direct from the Office in London, post-free, payable in advance—For One Year, 19s. 6d.; Half a Year, 9s. 9d.; Quarter of a Year, 5s.

37, SOUTHAMPTON STREET, COVENT GARDEN, W.C.

NATURE:

A WEEKLY ILLUSTRATED JOURNAL OF SCIENCE.

One of the leading objects of this periodical is to awaken in the public mind a more lively interest in Science. With this end in view it provides original Articles and Reviews, written by scientific men of the highest distinction in their various departments, expounding in a popular and yet authentic manner the grand results of scientific research, discussing the most recent scientific discoveries, and pointing out the bearing of Science upon Civilization and progress, and its claims to more general recognition, as well as to a higher place in the educational system of the country.

Published every Thursday, price 6d. Yearly Subscription, 28s.; Half-yearly, 14s. 6d.; Quarterly, 7s. 6d. Post-Office Orders to be made payable at King Street, Covent Garden, W.C.

MACMILLAN & CO., Bedford Street, Strand, W.C.

BOTANICAL DRYING PAPER

FOR DRYING FLOWERING PLANTS, FERNS, AND SEA-WEEDS.

Preserves form and colour in the best possible manner. Used by the Naturalists on board the Arctic ships, and also on the cruise of H.M.S. 'Challenger.'

16 in.	by	10	when folded,	15*s.*	per ream,	1*s.* 1*d.*	per quire.
18	„	11	„	19*s.*	„	1*s.* 4*d.*	„
20	„	12	„	23*s.*	„	1*s.* 9*d.*	„
20	„	16	„	30*s.*	„	2*s.* 2*d.*	„

☞ This Paper is too heavy to send by Post.

WEST, NEWMAN & CO., 54 HATTON GARDEN, LONDON.

TO BE SOLD.

HERBARIUM HEUFLERIANUM.

This Cryptogamic Herbal of the late Baron Lewis Hohenbühel, called Heufler, at Rasen (died in 1885), contains 1431 Genera, 8614 Species, with about 30,400 Specimens, among which there are also several Original Specimens, named after the late owner. This Herbal is likewise meritoriously acknowledged in the 'Third Session Report of the Zoological-Botanical Society at Vienna' (1853, pp. 160—170), in the Eighth Volume of V. Wurzbach's 'Biographical Lexicon of Austria' (1862, p. 454), and in No. 1 of the 'Austrian Botanical Periodical Journal of the year 1868.

Further information to be had of Baron Paul Hohenbühel, 3, Universitatsstrasse, Innsbruck, Tyrol, Austria-Hungary.

Just Published, Free by Post for Three Stamps.

NATURAL HISTORY AND SCIENTIFIC BOOK CIRCULAR. No. 71. — Containing Valuable Works on BOTANY (General, Fossil, and Cryptogamic Botany), Local and Foreign Floras, Medical and Economic Botany, Trees and Forestry.

William Wesley & Son, 28, Essex Street, Strand, London, W.C.

On the 1st of each Month, price Sixpence,

THE ENTOMOLOGIST:

AN ILLUSTRATED JOURNAL OF GENERAL ENTOMOLOGY.

Edited by John T. Carrington, F.L.S., with the assistance of Frederick Bond, F.Z.S., F.E.S., Edward A. Fitch, F.L.S., F.E.S., Richard South, F.E.S., J. Jenner Weir, F.L.S., F.Z.S., V.-P.E.S., F. Buchanan White, M.D., F.L.S., F.E.S.

Simpkin, Marshall & Co., Stationers' Hall Court.

ESTABLISHED 1851.

BIRKBECK BANK.—Southampton Buildings, Chancery Lane.

THREE per CENT. INTEREST allowed on DEPOSITS, repayable on demand.

TWO per CENT. INTEREST allowed on CURRENT ACCOUNTS, calculated on the minimum monthly balances, when not drawn below £100.

The Bank undertakes for its Customers, free of charge, the custody of Deeds, Writings, and other Securities and Valuables; the collection of Bills of Exchange, Dividends, and Coupons; and the purchase and sale of Stocks, Shares, and Annuities.

The BIRKBECK ALMANACK, with full particulars, can be obtained post free, on application to

FRANCIS RAVENSCROFT, Manager.

March 31st, 1884.

The Birkbeck Building Society's Annual Receipts exceed Five Millions.

HOW TO PURCHASE A HOUSE FOR TWO GUINEAS PER MONTH, with immediate Possession and no Rent to pay. Apply at the Office of the Birkbeck Building Society.

HOW TO PURCHASE A PLOT OF LAND FOR FIVE SHILLINGS PER MONTH, with immediate possession, either for Building or Gardening purposes. Apply at the Office of the Birkbeck Freehold Land Society. A Pamphlet, with full particulars, on application.

FRANCIS RAVENSCROFT, Manager.

Southampton Buildings, Chancery Lane.

LONDON: WEST, NEWMAN AND CO., 54, HATTON GARDEN, E.C.

A New (Eighth) Edition of the

LONDON CATALOGUE OF BRITISH PLANTS

containing numerous alterations and additions, is now ready Price 6*d.*; on stouter paper and bound in limp cloth, 1*s.*

GENERIC INDEX only, printed on a Card for use as a Guide to the Herbarium, 2*d.*

LONDON: GEORGE BELL & SONS, York Street, Covent Garden, W.C.

THE GARDEN:

A WEEKLY ILLUSTRATED JOURNAL OF HORTICULTURE IN ALL ITS BRANCHES.

Price Fourpence.

"Mr. Robinson's valuable and elegant weekly."—*The Saturday Review.*

The following are some of the subjects regularly discussed in THE GARDEN:—Hardy Flowers, the Conservatory, Town Gardens, the Wild Garden, the Greenhouse and Stove, Public Gardens, the Kitchen Garden, the Household, the Flower Garden, Landscape Gardening, the Fruit Garden, Garden Structures, Room and Window Gardens, Notes and Questions, Market Gardening, Trees and Shrubs, Garden Implements, and Appliances of all kinds.

Terms of Subscription.—Sent direct from the Office in London, post-free, payable in advance—For One Year, 19s. 6d.; Half a Year, 9s. 9d.; Quarter of a Year, 5s.

37, SOUTHAMPTON STREET, COVENT GARDEN, W.C.

NATURE:

A WEEKLY ILLUSTRATED JOURNAL OF SCIENCE.

One of the leading objects of this periodical is to awaken in the public mind a more lively interest in Science. With this end in view it provides original Articles and Reviews, written by scientific men of the highest distinction in their various departments, expounding in a popular and yet authentic manner the grand results of scientific research, discussing the most recent scientific discoveries, and pointing out the bearing of Science upon Civilization and progress, and its claims to more general recognition, as well as to a higher place in the educational system of the country.

Published every Thursday, price 6d. Yearly Subscription, 28s.; Half-yearly, 14s. 6d.; Quarterly, 7s. 6d. Post-Office Orders to be made payable at King Street, Covent Garden, W.C.

MACMILLAN & CO., Bedford Street, Strand, W.C.

BOTANICAL DRYING PAPER

FOR DRYING FLOWERING PLANTS, FERNS, AND SEA-WEEDS.

Preserves form and colour in the best possible manner. Used by the Naturalists on board the Arctic ships, and also on the cruise of H.M.S. 'Challenger.'

16 in.	by	10	when folded,	15*s.*	per ream,	1*s.* 1*d.*	per quire.
18	,,	11	,,	19*s.*	,,	1*s.* 4*d.*	,,
20	,,	12	,,	23*s.*	,,	1*s.* 9*d.*	,,
20	,,	16	,,	30*s.*	,,	2*s.* 2*d.*	,,

☞ This Paper is too heavy to send by Post.

WEST, NEWMAN & CO., 54 HATTON GARDEN, LONDON.

TO BE SOLD.

HERBARIUM HEUFLERIANUM.

This Cryptogamic Herbal of the late Baron Lewis Hohenbühel, called Heufler, at Rasen (died in 1885), contains 1431 Genera, 8614 Species, with about 30,400 Specimens, among which there are also several Original Specimens, named after the late owner. This Herbal is likewise meritoriously acknowledged in the 'Third Session Report of the Zoological-Botanical Society at Vienna' (1853, pp. 160—170), in the Eighth Volume of V. Wurzbach's 'Biographical Lexicon of Austria' (1862, p. 454), and in No. 1 of the 'Austrian Botanical Periodical Journal of the year 1868.

Further information to be had of Baron Paul Hohenbühel, 3, Universitatsstrasse, Innsbruck, Tyrol, Austria-Hungary.

Just Published, Free by Post for Three Stamps.

NATURAL HISTORY AND SCIENTIFIC BOOK CIRCULAR. No. 71. — Containing Valuable Works on BOTANY (General, Fossil, and Cryptogamic Botany), Local and Foreign Floras, Medical and Economic Botany, Trees and Forestry.

William Wesley & Son, 28, Essex Street, Strand, London, W.C.

On the 1st of each Month, price Sixpence,

THE ENTOMOLOGIST:

AN ILLUSTRATED JOURNAL OF GENERAL ENTOMOLOGY.

Edited by John T. Carrington, F.L.S., with the assistance of Frederick Bond, F.Z.S., F.E.S., Edward A. Fitch, F.L.S., F.E.S., Richard South, F.E.S., J. Jenner Weir, F.L.S., F.Z.S., V.-P.E.S., F. Buchanan White, M.D., F.L.S., F.E.S.

Simpkin, Marshall & Co., Stationers' Hall Court.

ESTABLISHED 1851.

BIRKBECK BANK.—Southampton Buildings, Chancery Lane. THREE per CENT. INTEREST allowed on DEPOSITS, repayable on demand.

TWO per CENT. INTEREST allowed on CURRENT ACCOUNTS, calculated on the minimum monthly balances, when not drawn below £100.

The Bank undertakes for its Customers, free of charge, the custody of Deeds, Writings, and other Securities and Valuables; the collection of Bills of Exchange, Dividends, and Coupons; and the purchase and sale of Stocks, Shares, and Annuities.

The BIRKBECK ALMANACK, with full particulars, can be obtained post free, on application to

FRANCIS RAVENSCROFT, Manager.

March 31st, 1884.

The Birkbeck Building Society's Annual Receipts exceed Five Millions.

HOW TO PURCHASE A HOUSE FOR TWO GUINEAS PER MONTH, with immediate Possession and no Rent to pay. Apply at the Office of the Birkbeck Building Society.

HOW TO PURCHASE A PLOT OF LAND FOR FIVE SHILLINGS PER MONTH, with immediate possession, either for Building or Gardening purposes. Apply at the Office of the Birkbeck Freehold Land Society. A Pamphlet, with full particulars, on application.

FRANCIS RAVENSCROFT, Manager.

Southampton Buildings, Chancery Lane.

LONDON: WEST NEWMAN AND CO., 54, HATTON GARDEN, E.C.